CETIFICATION

SDG No:	JC20386	Laboratory:	Accutest, New Jersey
Site:	BMS, Building 5 Area, PR Humacao, PR	Matrix:	Groundwater/Soil

SUMMARY: Groundwater and soil samples (Table 1) were collected on the BMSMC facility – Building 5 Area. The BMSMC facility is located in Humacao, PR. Samples were taken May 15, 2016 and were analyzed in Accutest Laboratory of Dayton, New Jersey for the ABN TCL Special List (1,4-Dioxane and Naphthalene were analyzed following the SIM technique) and for low molecular weight alcohols (LMWA) the results were reported under SDG No.: JC20386. Results were validated using the latest validation guidelines (July, 2015) of the EPA Hazardous Waste Support Section. The analyses performed are shown in Table 1. Individual data review worksheets are enclosed for each target analyte group. The data sample organic data samples summary form shows for analytes results that were qualified.

In summary the results are valid and can be used for decision taking purposes.

Table 1. Samples analyzed and analysis performed

SAMPLE ID	SAMPLE DESCRIPTION	MATRIX	ANALYSIS PERFORMED
JC20386-1	RA-9GWD	Groundwater	ABN TCL special list; 1,-4-dioxane and Naphthalene (SIM); LMWA
JC20386-2	RA3(3-4)	Soil	ABN TCL special list; 1,-4-dioxane and Naphthalene (SIM); LMWA
JC20386-3	RA9-GWS	Groundwater	ABN TCL special list

Reviewer Name: Rafael Infante
Chemist License 1888

Signature: Rafael Infante

Date: June 12, 2016

SGS Accutest

Report of Analysis

Client Sample ID:	RA-9GWD		
Lab Sample ID:	JC20386-1	**Date Sampled:**	05/15/16
Matrix:	AQ - Ground Water	**Date Received:**	05/17/16
Method:	SW846 8270D SW846 3510C	**Percent Solids:**	n/a
Project:	BMSMC, Building 5 Area, PR		

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	F157217.D	1	05/18/16	JJ	05/17/16	OP93986	EF6616
Run #2	F157247.D	20	05/18/16	BP	05/17/16	OP93986	EF6617

	Initial Volume	Final Volume
Run #1	870 ml	1.0 ml
Run #2	870 ml	1.0 ml

ABN TCL Special List

CAS No.	Compound	Result	RL	MDL	Units	Q
95-57-8	2-Chlorophenol	ND	5.7	0.94	ug/l	
59-50-7	4-Chloro-3-methyl phenol	ND	5.7	1.0	ug/l	
120-83-2	2,4-Dichlorophenol	ND	2.3	1.5	ug/l	
105-67-9	2,4-Dimethylphenol	ND	5.7	2.8	ug/l	
51-28-5	2,4-Dinitrophenol	ND	11	1.8	ug/l	
534-52-1	4,6-Dinitro-o-cresol	ND	5.7	1.5	ug/l	
95-48-7	2-Methylphenol	ND	2.3	1.0	ug/l	
	3&4-Methylphenol	ND	2.3	1.0	ug/l	
88-75-5	2-Nitrophenol	ND	5.7	1.1	ug/l	
100-02-7	4-Nitrophenol	ND	11	1.3	ug/l	
87-86-5	Pentachlorophenol	ND	5.7	1.6	ug/l	
108-95-2	Phenol	ND	2.3	0.45	ug/l	
58-90-2	2,3,4,6-Tetrachlorophenol	ND	5.7	1.7	ug/l	
95-95-4	2,4,5-Trichlorophenol	ND	5.7	1.5	ug/l	
88-06-2	2,4,6-Trichlorophenol	ND	5.7	1.1	ug/l	
83-32-9	Acenaphthene	ND	1.1	0.22	ug/l	
208-96-8	Acenaphthylene	ND	1.1	0.16	ug/l	
98-86-2	Acetophenone	ND	2.3	0.24	ug/l	
120-12-7	Anthracene	ND	1.1	0.24	ug/l	
1912-24-9	Atrazine	ND	2.3	0.51	ug/l	
100-52-7	Benzaldehyde	ND	5.7	0.33	ug/l	
56-55-3	Benzo(a)anthracene	ND	1.1	0.23	ug/l	
50-32-8	Benzo(a)pyrene	ND	1.1	0.24	ug/l	
205-99-2	Benzo(b)fluoranthene	ND	1.1	0.24	ug/l	
191-24-2	Benzo(g,h,i)perylene	ND	1.1	0.39	ug/l	
207-08-9	Benzo(k)fluoranthene	ND	1.1	0.24	ug/l	
101-55-3	4-Bromophenyl phenyl ether	ND	2.3	0.46	ug/l	
85-68-7	Butyl benzyl phthalate	ND	2.3	0.53	ug/l	
92-52-4	1,1'-Biphenyl	ND	1.1	0.24	ug/l	
91-58-7	2-Chloronaphthalene	ND	2.3	0.27	ug/l	
106-47-8	4-Chloroaniline	ND	5.7	0.39	ug/l	
86-74-8	Carbazole	ND	1.1	0.26	ug/l	

ND = Not detected MDL = Method Detection Limit
RL = Reporting Limit
E = Indicates value exceeds calibration range
J = Indicates an estimated value
B = Indicates analyte found in associated method blank
N = Indicates presumptive evidence of a compound

Report of Analysis

Client Sample ID:	RA-9GWD		
Lab Sample ID:	JC20386-1	**Date Sampled:**	05/15/16
Matrix:	AQ - Ground Water	**Date Received:**	05/17/16
Method:	SW846 8270D SW846 3510C	**Percent Solids:**	n/a
Project:	BMSMC, Building 5 Area, PR		

ABN TCL Special List

CAS No.	Compound	Result	RL	MDL	Units	Q
105-60-2	Caprolactam	ND	2.3	0.75	ug/l	
218-01-9	Chrysene	ND	1.1	0.20	ug/l	
111-91-1	bis(2-Chloroethoxy)methane	ND	2.3	0.32	ug/l	
111-44-4	bis(2-Chloroethyl)ether	ND	2.3	0.29	ug/l	
108-60-1	bis(2-Chloroisopropyl)ether	ND	2.3	0.46	ug/l	
7005-72-3	4-Chlorophenyl phenyl ether	ND	2.3	0.42	ug/l	
121-14-2	2,4-Dinitrotoluene	ND	1.1	0.63	ug/l	
606-20-2	2,6-Dinitrotoluene	ND	1.1	0.55	ug/l	
91-94-1	3,3'-Dichlorobenzidine	ND	2.3	0.58	ug/l	
123-91-1	1,4-Dioxane	553 a	23	15	ug/l	
53-70-3	Dibenzo(a,h)anthracene	ND	1.1	0.38	ug/l	
132-64-9	Dibenzofuran	ND	5.7	0.25	ug/l	
84-74-2	Di-n-butyl phthalate	ND	2.3	0.57	ug/l	
117-84-0	Di-n-octyl phthalate	ND	2.3	0.27	ug/l	
84-66-2	Diethyl phthalate	ND	2.3	0.30	ug/l	
131-11-3	Dimethyl phthalate	ND	2.3	0.25	ug/l	
117-81-7	bis(2-Ethylhexyl)phthalate	ND	2.3	1.9	ug/l	
206-44-0	Fluoranthene	ND	1.1	0.20	ug/l	
86-73-7	Fluorene	ND	1.1	0.20	ug/l	
118-74-1	Hexachlorobenzene	ND	1.1	0.37	ug/l	
87-68-3	Hexachlorobutadiene	ND	1.1	0.57	ug/l	
77-47-4	Hexachlorocyclopentadiene	ND	11	3.2	ug/l	
67-72-1	Hexachloroethane	ND	2.3	0.45	ug/l	
193-39-5	Indeno(1,2,3-cd)pyrene	ND	1.1	0.38	ug/l	
78-59-1	Isophorone	ND	2.3	0.32	ug/l	
90-12-0	1-Methylnaphthalene	ND	1.1	0.30	ug/l	
91-57-6	2-Methylnaphthalene	ND	1.1	0.24	ug/l	
88-74-4	2-Nitroaniline	ND	5.7	0.32	ug/l	
99-09-2	3-Nitroaniline	ND	5.7	0.44	ug/l	
100-01-6	4-Nitroaniline	ND	5.7	0.51	ug/l	
98-95-3	Nitrobenzene	ND	2.3	0.74	ug/l	
621-64-7	N-Nitroso-di-n-propylamine	ND	2.3	0.55	ug/l	
86-30-6	N-Nitrosodiphenylamine	ND	5.7	0.26	ug/l	
85-01-8	Phenanthrene	ND	1.1	0.20	ug/l	
129-00-0	Pyrene	ND	1.1	0.25	ug/l	
95-94-3	1,2,4,5-Tetrachlorobenzene	ND	2.3	0.43	ug/l	

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
367-12-4	2-Fluorophenol	42%	27%	14-88%

ND = Not detected MDL = Method Detection Limit
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N = Indicates presumptive evidence of a compound

Report of Analysis

Client Sample ID:	RA-9GWD		
Lab Sample ID:	JC20386-1	**Date Sampled:**	05/15/16
Matrix:	AQ - Ground Water	**Date Received:**	05/17/16
Method:	SW846 8270D SW846 3510C	**Percent Solids:**	n/a
Project:	BMSMC, Building 5 Area, PR		

ABN TCL Special List

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
4165-62-2	Phenol-d5	31%	23%	10-110%
118-79-6	2,4,6-Tribromophenol	85%	77%	39-149%
4165-60-0	Nitrobenzene-d5	73%	64%	32-128%
321-60-8	2-Fluorobiphenyl	63%	72%	35-119%
1718-51-0	Terphenyl-d14	59%	63%	10-126%

(a) Result is from Run# 2

ND = Not detected MDL = Method Detection Limit
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E = Indicates value exceeds calibration range

J = Indicates an estimated value
B = Indicates analyte found in associated method blank
N = Indicates presumptive evidence of a compound

SGS Accutest

Report of Analysis

Client Sample ID:	RA-9GWD		
Lab Sample ID:	JC20386-1	**Date Sampled:**	05/15/16
Matrix:	AQ - Ground Water	**Date Received:**	05/17/16
Method:	SW846 8270D BY SIM SW846 3510C	**Percent Solids:**	n/a
Project:	BMSMC, Building 5 Area, PR		

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	4M65346.D	1	05/18/16	LK	05/17/16	OP93986A	E4M2924
Run #2							

	Initial Volume	Final Volume
Run #1	870 ml	1.0 ml
Run #2		

CAS No.	Compound	Result	RL	MDL	Units	Q
91-20-3	Naphthalene	ND	0.11	0.034	ug/l	

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
4165-60-0	Nitrobenzene-d5	70%		24-125%
321-60-8	2-Fluorobiphenyl	72%		19-127%
1718-51-0	Terphenyl-d14	58%		10-119%

ND = Not detected MDL = Method Detection Limit
RL = Reporting Limit
E = Indicates value exceeds calibration range

J = Indicates an estimated value
B = Indicates analyte found in associated method blank
N = Indicates presumptive evidence of a compound

SGS Accutest

Report of Analysis

Client Sample ID:	RA-9GWD		
Lab Sample ID:	JC20386-1	**Date Sampled:**	05/15/16
Matrix:	AQ - Ground Water	**Date Received:**	05/17/16
Method:	SW846-8015C (DAI)	**Percent Solids:**	n/a
Project:	BMSMC, Building 5 Area, PR		

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	GH105031.D	1	05/18/16	XPL	n/a	n/a	GGH5289
Run #2							

Low Molecular Alcohol List

CAS No.	Compound	Result	RL	MDL	Units	Q
64-17-5	Ethanol	ND	100	55	ug/l	
78-83-1	Isobutyl Alcohol	ND	100	36	ug/l	
67-63-0	Isopropyl Alcohol	ND	100	68	ug/l	
71-23-8	n-Propyl Alcohol	ND	100	43	ug/l	
71-36-3	n-Butyl Alcohol	ND	100	87	ug/l	
78-92-2	sec-Butyl Alcohol	ND	100	66	ug/l	
67-56-1	Methanol	ND	200	71	ug/l	

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
111-27-3	Hexanol	98%		56-145%
111-27-3	Hexanol	98%		56-145%

ND = Not detected MDL = Method Detection Limit
RL = Reporting Limit
E = Indicates value exceeds calibration range
J = Indicates an estimated value
B = Indicates analyte found in associated method blank
N = Indicates presumptive evidence of a compound

SGS Accutest

Report of Analysis

Client Sample ID:	RA3(3-4)		
Lab Sample ID:	JC20386-2	**Date Sampled:**	05/15/16
Matrix:	SO - Soil	**Date Received:**	05/17/16
Method:	SW846 8270D SW846 3546	**Percent Solids:**	79.2
Project:	BMSMC, Building 5 Area, PR		

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	Z110822.D	1	05/20/16	AC	05/18/16	OP93998	EZ5538
Run #2							

	Initial Weight	Final Volume
Run #1	31.3 g	1.0 ml
Run #2		

ABN TCL Special List

CAS No.	Compound	Result	RL	MDL	Units	Q
95-57-8	2-Chlorophenol	ND	81	20	ug/kg	
59-50-7	4-Chloro-3-methyl phenol	ND	200	25	ug/kg	
120-83-2	2,4-Dichlorophenol	ND	200	34	ug/kg	
105-67-9	2,4-Dimethylphenol	ND	200	72	ug/kg	
51-28-5	2,4-Dinitrophenol	ND	200	150	ug/kg	
534-52-1	4,6-Dinitro-o-cresol	ND	200	43	ug/kg	
95-48-7	2-Methylphenol	ND	81	26	ug/kg	
	3&4-Methylphenol	ND	81	33	ug/kg	
88-75-5	2-Nitrophenol	ND	200	27	ug/kg	
100-02-7	4-Nitrophenol	ND	400	110	ug/kg	
87-86-5	Pentachlorophenol	ND	200	38	ug/kg	
108-95-2	Phenol	ND	81	21	ug/kg	
58-90-2	2,3,4,6-Tetrachlorophenol	ND	200	27	ug/kg	
95-95-4	2,4,5-Trichlorophenol	ND	200	30	ug/kg	
88-06-2	2,4,6-Trichlorophenol	ND	200	24	ug/kg	
83-32-9	Acenaphthene	ND	40	14	ug/kg	
208-96-8	Acenaphthylene	ND	40	20	ug/kg	
98-86-2	Acetophenone	ND	200	8.7	ug/kg	
120-12-7	Anthracene	ND	40	25	ug/kg	
1912-24-9	Atrazine	ND	81	17	ug/kg	
56-55-3	Benzo(a)anthracene	ND	40	11	ug/kg	
50-32-8	Benzo(a)pyrene	ND	40	18	ug/kg	
205-99-2	Benzo(b)fluoranthene	ND	40	18	ug/kg	
191-24-2	Benzo(g,h,i)perylene	ND	40	20	ug/kg	
207-08-9	Benzo(k)fluoranthene	ND	40	19	ug/kg	
101-55-3	4-Bromophenyl phenyl ether	ND	81	16	ug/kg	
85-68-7	Butyl benzyl phthalate	ND	81	9.8	ug/kg	
92-52-4	1,1'-Biphenyl	ND	81	5.5	ug/kg	
100-52-7	Benzaldehyde	ND	200	10	ug/kg	
91-58-7	2-Chloronaphthalene	ND	81	9.6	ug/kg	
106-47-8	4-Chloroaniline	ND	200	15	ug/kg	
86-74-8	Carbazole	ND	81	5.8	ug/kg	

ND = Not detected MDL = Method Detection Limit
RL = Reporting Limit
E = Indicates value exceeds calibration range
J = Indicates an estimated value
B = Indicates analyte found in associated method blank
N = Indicates presumptive evidence of a compound

Report of Analysis

Client Sample ID:	RA3(3-4)		
Lab Sample ID:	JC20386-2	**Date Sampled:**	05/15/16
Matrix:	SO - Soil	**Date Received:**	05/17/16
Method:	SW846 8270D SW846 3546	**Percent Solids:**	79.2
Project:	BMSMC, Building 5 Area, PR		

ABN TCL Special List

CAS No.	Compound	Result	RL	MDL	Units	Q
105-60-2	Caprolactam	ND	81	16	ug/kg	
218-01-9	Chrysene	ND	40	13	ug/kg	
111-91-1	bis(2-Chloroethoxy)methane	ND	81	8.6	ug/kg	
111-44-4	bis(2-Chloroethyl)ether	ND	81	17	ug/kg	
108-60-1	bis(2-Chloroisopropyl)ether	ND	81	14	ug/kg	
7005-72-3	4-Chlorophenyl phenyl ether	ND	81	13	ug/kg	
121-14-2	2,4-Dinitrotoluene	ND	40	13	ug/kg	
606-20-2	2,6-Dinitrotoluene	ND	40	20	ug/kg	
91-94-1	3,3'-Dichlorobenzidine	ND	81	34	ug/kg	
123-91-1	1,4-Dioxane	441	40	27	ug/kg	
53-70-3	Dibenzo(a,h)anthracene	ND	40	18	ug/kg	
132-64-9	Dibenzofuran	32.3	81	16	ug/kg	J
84-74-2	Di-n-butyl phthalate	ND	81	6.6	ug/kg	
117-84-0	Di-n-octyl phthalate	ND	81	10	ug/kg	
84-66-2	Diethyl phthalate	ND	81	8.6	ug/kg	
131-11-3	Dimethyl phthalate	ND	81	7.2	ug/kg	
117-81-7	bis(2-Ethylhexyl)phthalate	116	81	9.4	ug/kg	
206-44-0	Fluoranthene	19.2	40	18	ug/kg	J
86-73-7	Fluorene	25.3	40	19	ug/kg	J
118-74-1	Hexachlorobenzene	ND	81	10	ug/kg	
87-68-3	Hexachlorobutadiene	ND	40	16	ug/kg	
77-47-4	Hexachlorocyclopentadiene	ND	400	16	ug/kg	
67-72-1	Hexachloroethane	ND	200	20	ug/kg	
193-39-5	Indeno(1,2,3-cd)pyrene	ND	40	19	ug/kg	
78-59-1	Isophorone	ND	81	8.6	ug/kg	
90-12-0	1-Methylnaphthalene	1340	81	7.9	ug/kg	
91-57-6	2-Methylnaphthalene	1510	81	9.1	ug/kg	
88-74-4	2-Nitroaniline	ND	200	9.5	ug/kg	
99-09-2	3-Nitroaniline	ND	200	10	ug/kg	
100-01-6	4-Nitroaniline	ND	200	10	ug/kg	
91-20-3	Naphthalene	353	40	11	ug/kg	
98-95-3	Nitrobenzene	ND	81	16	ug/kg	
621-64-7	N-Nitroso-di-n-propylamine	ND	81	12	ug/kg	
86-30-6	N-Nitrosodiphenylamine	ND	200	15	ug/kg	
85-01-8	Phenanthrene	28.2	40	14	ug/kg	J
129-00-0	Pyrene	19.4	40	13	ug/kg	J
95-94-3	1,2,4,5-Tetrachlorobenzene	ND	200	10	ug/kg	

ND = Not detected MDL = Method Detection Limit
RL = Reporting Limit
E = Indicates value exceeds calibration range
J = Indicates an estimated value
B = Indicates analyte found in associated method blank
N = Indicates presumptive evidence of a compound

Report of Analysis

Client Sample ID:	RA3(3-4)		
Lab Sample ID:	JC20386-2	**Date Sampled:**	05/15/16
Matrix:	SO - Soil	**Date Received:**	05/17/16
Method:	SW846 8270D SW846 3546	**Percent Solids:**	79.2
Project:	BMSMC, Building 5 Area, PR		

ABN TCL Special List

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
367-12-4	2-Fluorophenol	73%		30-106%
4165-62-2	Phenol-d5	75%		30-106%
118-79-6	2,4,6-Tribromophenol	76%		24-140%
4165-60-0	Nitrobenzene-d5	82%		26-122%
321-60-8	2-Fluorobiphenyl	75%		36-112%
1718-51-0	Terphenyl-d14	77%		36-132%

ND = Not detected MDL = Method Detection Limit
RL = Reporting Limit
E = Indicates value exceeds calibration range

J = Indicates an estimated value
B = Indicates analyte found in associated method blank
N = Indicates presumptive evidence of a compound

SGS Accutest

Report of Analysis

Client Sample ID:	RA3(3-4)		
Lab Sample ID:	JC20386-2	**Date Sampled:**	05/15/16
Matrix:	SO - Soil	**Date Received:**	05/17/16
Method:	SW846 8270D BY SIM SW846 3546	**Percent Solids:**	79.2
Project:	BMSMC, Building 5 Area, PR		

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	4P16360.D	1	05/19/16	LK	05/18/16	OP93998A	E4P866
Run #2							

	Initial Weight	Final Volume
Run #1	31.3 g	1.0 ml
Run #2		

CAS No.	Compound	Result	RL	Units	Q

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
4165-60-0	Nitrobenzene-d5	87%		15-138%
321-60-8	2-Fluorobiphenyl	50%		12-148%
1718-51-0	Terphenyl-d14	88%		10-157%

ND = Not detected
RL = Reporting Limit
E = Indicates value exceeds calibration range

J = Indicates an estimated value
B = Indicates analyte found in associated method blank
N = Indicates presumptive evidence of a compound

SGS Accutest

Report of Analysis

Client Sample ID:	RA3(3-4)		
Lab Sample ID:	JC20386-2	**Date Sampled:**	05/15/16
Matrix:	SO - Soil	**Date Received:**	05/17/16
Method:	SW846-8015C (DAI)	**Percent Solids:**	79.2
Project:	BMSMC, Building 5 Area, PR		

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	GH105064.D	1	05/18/16	XPL	n/a	n/a	GGH5290
Run #2							

	Initial Weight
Run #1	5.0 g
Run #2	

Low Molecular Alcohol List

CAS No.	Compound	Result	RL	MDL	Units	Q
64-17-5	Ethanol	ND	130	87	ug/kg	
78-83-1	Isobutyl Alcohol	ND	130	74	ug/kg	
67-63-0	Isopropyl Alcohol	ND	130	72	ug/kg	
71-23-8	n-Propyl Alcohol	ND	130	51	ug/kg	
71-36-3	n-Butyl Alcohol	ND	130	69	ug/kg	
78-92-2	sec-Butyl Alcohol	ND	130	67	ug/kg	
67-56-1	Methanol	ND	250	60	ug/kg	

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
111-27-3	Hexanol	108%		52-141%
111-27-3	Hexanol	110%		52-141%

ND = Not detected MDL = Method Detection Limit
RL = Reporting Limit
E = Indicates value exceeds calibration range

J = Indicates an estimated value
B = Indicates analyte found in associated method blank
N = Indicates presumptive evidence of a compound

SGS Accutest

Report of Analysis

Client Sample ID:	RA9-GWS		
Lab Sample ID:	JC20386-3	**Date Sampled:**	05/15/16
Matrix:	AQ - Ground Water	**Date Received:**	05/17/16
Method:	SW846 8270D SW846 3510C	**Percent Solids:**	n/a
Project:	BMSMC, Building 5 Area, PR		

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	F157218.D	1	05/18/16	JJ	05/17/16	OP93986	EF6616
Run #2	F157246.D	20	05/18/16	BP	05/17/16	OP93986	EF6617

	Initial Volume	Final Volume
Run #1	870 ml	1.0 ml
Run #2	870 ml	1.0 ml

ABN TCL Special List

CAS No.	Compound	Result	RL	MDL	Units	Q
95-57-8	2-Chlorophenol	ND	5.7	0.94	ug/l	
59-50-7	4-Chloro-3-methyl phenol	ND	5.7	1.0	ug/l	
120-83-2	2,4-Dichlorophenol	ND	2.3	1.5	ug/l	
105-67-9	2,4-Dimethylphenol	ND	5.7	2.8	ug/l	
51-28-5	2,4-Dinitrophenol	ND	11	1.8	ug/l	
534-52-1	4,6-Dinitro-o-cresol	ND	5.7	1.5	ug/l	
95-48-7	2-Methylphenol	ND	2.3	1.0	ug/l	
	3&4-Methylphenol	ND	2.3	1.0	ug/l	
88-75-5	2-Nitrophenol	ND	5.7	1.1	ug/l	
100-02-7	4-Nitrophenol	ND	11	1.3	ug/l	
87-86-5	Pentachlorophenol	ND	5.7	1.6	ug/l	
108-95-2	Phenol	ND	2.3	0.45	ug/l	
58-90-2	2,3,4,6-Tetrachlorophenol	ND	5.7	1.7	ug/l	
95-95-4	2,4,5-Trichlorophenol	ND	5.7	1.5	ug/l	
88-06-2	2,4,6-Trichlorophenol	ND	5.7	1.1	ug/l	
83-32-9	Acenaphthene	ND	1.1	0.22	ug/l	
208-96-8	Acenaphthylene	ND	1.1	0.16	ug/l	
98-86-2	Acetophenone	ND	2.3	0.24	ug/l	
120-12-7	Anthracene	ND	1.1	0.24	ug/l	
1912-24-9	Atrazine	ND	2.3	0.51	ug/l	
100-52-7	Benzaldehyde	ND	5.7	0.33	ug/l	
56-55-3	Benzo(a)anthracene	ND	1.1	0.23	ug/l	
50-32-8	Benzo(a)pyrene	ND	1.1	0.24	ug/l	
205-99-2	Benzo(b)fluoranthene	ND	1.1	0.24	ug/l	
191-24-2	Benzo(g,h,i)perylene	ND	1.1	0.39	ug/l	
207-08-9	Benzo(k)fluoranthene	ND	1.1	0.24	ug/l	
101-55-3	4-Bromophenyl phenyl ether	ND	2.3	0.46	ug/l	
85-68-7	Butyl benzyl phthalate	ND	2.3	0.53	ug/l	
92-52-4	1,1'-Biphenyl	ND	1.1	0.24	ug/l	
91-58-7	2-Chloronaphthalene	ND	2.3	0.27	ug/l	
106-47-8	4-Chloroaniline	ND	5.7	0.39	ug/l	
86-74-8	Carbazole	ND	1.1	0.26	ug/l	

ND = Not detected MDL = Method Detection Limit
RL = Reporting Limit
E = Indicates value exceeds calibration range
J = Indicates an estimated value
B = Indicates analyte found in associated method blank
N = Indicates presumptive evidence of a compound

Report of Analysis

Client Sample ID:	RA9-GWS		
Lab Sample ID:	JC20386-3	**Date Sampled:**	05/15/16
Matrix:	AQ - Ground Water	**Date Received:**	05/17/16
Method:	SW846 8270D SW846 3510C	**Percent Solids:**	n/a
Project:	BMSMC, Building 5 Area, PR		

ABN TCL Special List

CAS No.	Compound	Result	RL	MDL	Units	Q
105-60-2	Caprolactam	ND	2.3	0.75	ug/l	
218-01-9	Chrysene	ND	1.1	0.20	ug/l	
111-91-1	bis(2-Chloroethoxy)methane	ND	2.3	0.32	ug/l	
111-44-4	bis(2-Chloroethyl)ether	ND	2.3	0.29	ug/l	
108-60-1	bis(2-Chloroisopropyl)ether	ND	2.3	0.46	ug/l	
7005-72-3	4-Chlorophenyl phenyl ether	ND	2.3	0.42	ug/l	
121-14-2	2,4-Dinitrotoluene	ND	1.1	0.63	ug/l	
606-20-2	2,6-Dinitrotoluene	ND	1.1	0.55	ug/l	
91-94-1	3,3'-Dichlorobenzidine	ND	2.3	0.58	ug/l	
123-91-1	1,4-Dioxane	968 a	23	15	ug/l	
53-70-3	Dibenzo(a,h)anthracene	ND	1.1	0.38	ug/l	
132-64-9	Dibenzofuran	ND	5.7	0.25	ug/l	
84-74-2	Di-n-butyl phthalate	ND	2.3	0.57	ug/l	
117-84-0	Di-n-octyl phthalate	ND	2.3	0.27	ug/l	
84-66-2	Diethyl phthalate	ND	2.3	0.30	ug/l	
131-11-3	Dimethyl phthalate	ND	2.3	0.25	ug/l	
117-81-7	bis(2-Ethylhexyl)phthalate	ND	2.3	1.9	ug/l	
206-44-0	Fluoranthene	ND	1.1	0.20	ug/l	
86-73-7	Fluorene	ND	1.1	0.20	ug/l	
118-74-1	Hexachlorobenzene	ND	1.1	0.37	ug/l	
87-68-3	Hexachlorobutadiene	ND	1.1	0.57	ug/l	
77-47-4	Hexachlorocyclopentadiene	ND	11	3.2	ug/l	
67-72-1	Hexachloroethane	ND	2.3	0.45	ug/l	
193-39-5	Indeno(1,2,3-cd)pyrene	ND	1.1	0.38	ug/l	
78-59-1	Isophorone	ND	2.3	0.32	ug/l	
91-57-6	2-Methylnaphthalene	ND	1.1	0.24	ug/l	
88-74-4	2-Nitroaniline	ND	5.7	0.32	ug/l	
99-09-2	3-Nitroaniline	ND	5.7	0.44	ug/l	
100-01-6	4-Nitroaniline	ND	5.7	0.51	ug/l	
98-95-3	Nitrobenzene	ND	2.3	0.74	ug/l	
621-64-7	N-Nitroso-di-n-propylamine	ND	2.3	0.55	ug/l	
86-30-6	N-Nitrosodiphenylamine	ND	5.7	0.26	ug/l	
85-01-8	Phenanthrene	ND	1.1	0.20	ug/l	
129-00-0	Pyrene	ND	1.1	0.25	ug/l	
95-94-3	1,2,4,5-Tetrachlorobenzene	ND	2.3	0.43	ug/l	

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
367-12-4	2-Fluorophenol	48%	38%	14-88%
4165-62-2	Phenol-d5	35%	28%	10-110%

ND = Not detected MDL = Method Detection Limit
RL = Reporting Limit
E = Indicates value exceeds calibration range
J = Indicates an estimated value
B = Indicates analyte found in associated method blank
N = Indicates presumptive evidence of a compound

Report of Analysis

Client Sample ID:	RA9-GWS		
Lab Sample ID:	JC20386-3	**Date Sampled:**	05/15/16
Matrix:	AQ - Ground Water	**Date Received:**	05/17/16
Method:	SW846 8270D SW846 3510C	**Percent Solids:**	n/a
Project:	BMSMC, Building 5 Area, PR		

ABN TCL Special List

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
118-79-6	2,4,6-Tribromophenol	98%	87%	39-149%
4165-60-0	Nitrobenzene-d5	82%	86%	32-128%
321-60-8	2-Fluorobiphenyl	72%	85%	35-119%
1718-51-0	Terphenyl-d14	68%	75%	10-126%

(a) Result is from Run# 2

SGS ACCUTEST-NJ

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TEL. 732-329-0200 FAX 732-329-3499/3480
www.accutest.com

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801219536062

JC20386

Company Name: Anderson Mulholland Associates
Project Name: BMS Release Assessment
Address: 2700 Westchester
City: Purchase NY
Project Manager: Jerry Taylor
Phone #: 914-251-0400
Sampler(s) Name(s): N. Rivera, T. Taylor, D. Lindstrand

Billing Information (if different from Report to):
Company Name:
Street Address:
City / State / Zip:
Attention:

Project #: Humacao PR
Client Purchase Order #:
Project Manager:

#	Field ID / Point of Collection	MEOH/DI Vial #	Collected: Date	Time	Sampled by	Matrix	# of bottles	Preservation: HCl	HNO3	H2SO4	NONE	DI Water	MEOH	ENCORE	SVOC - Method 8270D	LMA - Method 8015B	Pesticides - Method 8082 VA Drainage & Naphthalene by Method 8270D SIM	LAB USE ONLY
1	RA-9GWD		05/16/16	1200	TT	GW	5	3			2				X	X	X	
2	RA3 (3-4)		05/16/16	1325	TT	SO	2				2				X	X	X	E86
3	RA9-GWS		05/16/16	1450	TT	GW	2				2				X			11119
																		F.S.1

INITIAL ASESSMENT 38TH
CABEL VERIFICATION 4th

Turnaround Time (Business days)
- [X] Std. 10 Business Days for soil Samples
- [ ] 5 Day RUSH
- [ ] 3 Day RUSH
- [X] 1 Day RUSH for aqueous samples
- [ ] other

Data Deliverable Information
- [ ] Commercial "A" (Level 1)
- [ ] Commercial "B" (Level 2)
- [X] FULLT1 (Level 3+4)
- [ ] NJ Reduced
- [ ] Commercial "C"
- [ ] NJ State of Known Quality Protocol Reporting

Commercial "A" = Results Only, Commercial "B" = Results + QC Summary
NJ Reduced = Results + QC Summary + Partial Raw data

- [ ] NYASP Category A
- [ ] NYASP Category B
- [ ] State Forms
- [ ] EDD Format
- [ ] Other

Comments / Special Instructions
Add to Report: 1-methyl naphthalene with SVOC by Method 8270D

Sample inventory is verified upon receipt in the Laboratory

Sample Custody must be documented below each time samples change possession, including courier delivery.

	Relinquished by	Date Time	Received By	Relinquished By	Date Time	Received By
1		05/16/16 1520	1 Fed EX	2 Fed EX	5/17/16 0900	2
3			3	4		4
5			5	579		On Ice: 10 Cooler Temp: 4.1

EXECUTIVE NARRATIVE

SDG No:	**JC20386**	Laboratory:	**Accutest, Florida**
Analysis:	**SW846-8015C**	Number of Samples:	**2**
Location:	BMSMC, Building 5 Area Humacao, PR		

SUMMARY: Two (2) samples were analyzed for the low molecular weight alcohols (LMWAs) list following method SW846-8015C. The sample results were assessed according to USEPA data validation guidance documents in the following order of precedence: "Test Methods for Evaluating Solid Waste, Physical/Chemical Methods SW-846 (Final Update III, December 1996)," specifically for Methods 8000/8015C are utilized. The QC criteria and data validation actions listed on the data review worksheets are from the primary guidance document, unless otherwise noted.

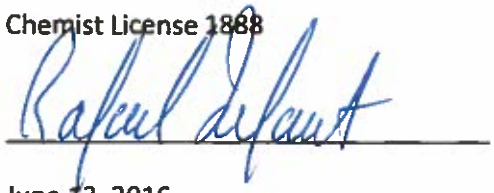
Results are valid and can be used for decision making purposes.

Critical issues:	**None**
Major:	**None**
Minor:	**None**

Critical findings:	**None**
Major findings:	**None**
Minor findings:	**None**

COMMENTS: Results are valid and can be used for decision making purposes.

Reviewers Name: Rafael Infante
Chemist License 1888

Signature: 

Date: June 12, 2016

SAMPLE ORGANIC DATA SAMPLE SUMMARY

Sample ID: JC20386-1
Sample location: BMSMC Building 5 Area
Sampling date: 5/15/2016
Matrix: Groundwater

METHOD: 8015C

Analyte Name	Result	Units	Dilution Factor	Lab Flag	Validation	Reportable
Ethanol	100	ug/l	1.0	-	U	Yes
Isobutyl Alcohol	100	ug/l	1.0	-	U	Yes
Isopropyl Alcohol	100	ug/l	1.0	-	U	Yes
n-Propyl Alcohol	100	ug/l	1.0	-	U	Yes
n-Butyl Alcohol	100	ug/l	1.0	-	U	Yes
sec-Butyl Alcohol	100	ug/l	1.0	-	U	Yes
Methanol	200	ug/l	1.0	-	U	Yes

Sample ID: JC20386-2
Sample location: BMSMC Building 5 Area
Sampling date: 5/15/2016
Matrix: Soil

METHOD: 8015C

Analyte Name	Result	Units	Dilution Factor	Lab Flag	Validation	Reportable
Ethanol	130	ug/kg	1.0	-	U	Yes
Isobutyl Alcohol	130	ug/kg	1.0	-	U	Yes
Isopropyl Alcohol	130	ug/kg	1.0	-	U	Yes
n-Propyl Alcohol	130	ug/kg	1.0	-	U	Yes
n-Butyl Alcohol	130	ug/kg	1.0	-	U	Yes
sec-Butyl Alcohol	130	ug/kg	1.0	-	U	Yes
Methanol	250	ug/kg	1.0	-	U	Yes

DATA REVIEW WORKSHEETS

Project Number:___JC20386_____
Date:_____05/15/2016_____
Shipping Date:____05/16/2016_____
EPA Region:_____2_____

REVIEW OF VOLATILE ORGANIC PACKAGE

The following guidelines for evaluating volatile organics were created to delineate required validation actions. This document will assist the reviewer in using professional judgment to make more informed decision and in better serving the needs of the data users. The sample results were assessed according to USEPA data validation guidance documents in the following order of precedence: "Test Methods for Evaluating Solid Waste, Physical/Chemical Methods SW-846 (Final Update III, December 1023R)," specifically for Methods 8000/8015C are utilized. The QC criteria and data validation actions listed on the data review worksheets are from the primary guidance document, unless otherwise noted.

The hardcopied (laboratory name) _Accutest_____ data package received has been reviewed and the quality control and performance data summarized. The modified data review for VOCs included:

Lab. Project/SDG No.: __JC20386_____ Sample matrix: __Soil/Groundwater_____
No. of Samples: _____2_____

Trip blank No.: _____-_____
Field blank No.: _____-_____
Equipment blank No.:___-_____
Field duplicate No.:_____-_____ _____

___X___ Data Completeness
___X___ Holding Times
___N/A_ GC/MS Tuning
___N/A_ Internal Standard Performance
___X___ Blanks
___X___ Surrogate Recoveries
___X___ Matrix Spike/Matrix Spike Duplicate
___X___ Laboratory Control Spikes
___X___ Field Duplicates
___X___ Calibrations
___X___ Compound Identifications
___X___ Compound Quantitation
___X___ Quantitation Limits

Overall Comments:_Selected_low_molecular_weight_alcohols_by_SW-846_8015C_____
_____

Definition of Qualifiers:
J- Estimated results
U- Compound not detected
R- Rejected data
UJ- Estimated nondetect

Reviewer:_____
Date:__June_12,_2016_____

DATA REVIEW WORKSHEETS

DATA COMPLETENESS

MISSING INFORMATION	DATE LAB. CONTACTED	DATE RECEIVED

All criteria were met __X___
Criteria were not met
and/or see below ____

HOLDING TIMES

The objective of this parameter is to ascertain the validity of the results based on the holding time of the sample from time of collection to the time of analysis.

Complete table for all samples and note the analysis and/or preservation not within criteria

SAMPLE ID	DATE SAMPLED	DATE ANALYZED	pH	ACTION
Samples analyzed within the holding time. All samples properly preserved.				

Criteria

Aqueous samples – 14 days from sample collection for preserved samples (pH $\leq$ 2, 4°C), no air bubbles.
Aqueous samples – 7 days from sample collection for unpreserved samples, 4°C, no air bubbles.
Soil samples- 7 days from sample collection.
Cooler temperature (Criteria: 4 $\pm$ 2 °C): 4.5°C

Actions

If the VOCs vial(s) have air bubbles, estimate positive results (J) and reject nondetects (R).
If the % solids of soil samples is 10-50%, estimates positive results (J) and nondetects (UJ)
If the % solid of soil samples is < 10%, estimate positive results (J) and reject nondetects (R).
If holding times are exceeded but < 14 days beyond criteria, estimate positive results (J) and nondetects (UJ).
If holding times are exceeded but < 28 days beyond criteria, estimate positive results (J) and reject nondetects (R).
If holding times are grossly exceeded (> 28 days beyond criteria), reject all results (R).
If samples were not iced or if the ice were melted (> 10°C), estimate positive results (J) and nondetects (UJ).

All criteria were met __N/A__
Criteria were not met see below _____

GC/MS TUNING

The assessment of the tuning results is to determine if the sample instrumentation is within the standard tuning QC limits

__N/A_ The BFB performance results were reviewed and found to be within the specified criteria.

__N/A_ BFB tuning was performed for every 12 hours of sample analysis.

If no, use professional judgment to determine whether the associated data should be accepted, qualified or rejected.

List the samples affected: _____

If mass calibration is in error, all associated data are rejected.

All criteria were met __X__
Criteria were not met
and/or see below _____

CALIBRATION VERIFICATION

Compliance requirements for satisfactory instrument calibration are established to ensure that the instrument is capable of producing and maintaining acceptable quantitative data.

Date of initial calibration:_____05/17/16_____
Dates of initial calibration verification:_____05/17/16_____
Dates of continuing calibration verification:_____05/18/16_____
Dates of final calibration verification:_____05/18/16_____
Instrument ID number:_____GCGH_____
Matrix/Level:_____Aqueous/low_____

DATE	LAB FILE ID#	CRITERIA OUT RFs, %RSD, %D, r	COMPOUND	SAMPLES AFFECTED

Note: Initial, continuing, and final calibration verifications meets method specific requirements in the two columns.

Criteria

All RFs must be > 0.05 regardless of method requirements for SPCC.
All %RSD must be ≤ 15 % regardless of method requirements for CCC.
All %Ds must be ≤ 20% regardless of method requirements for CCC.
It should be noted that Region 2 SOP HW-24 does not specify criterion for the curve correlation coefficient (r). A limit for r of ≥ 0.995 has therefore been utilized as professional judgment.

Actions

If any compound has an initial RF or a continuing RF of < 0.05, estimate positive results (J) and reject nondetects (R), regardless of method requirements.
If any compound has a %RSD > 15%, estimate positive results (J) and use professional judgment to qualify nondetects.
If any compound has a %RSD > 90%, estimate positive results (J) and reject nondetects (R).
If any compound has a % D > 20%, estimate positive results (J) and reject nondetects (R).
If any compound has a % D > 20%, estimate positive results (J) and nondetects (UJ).
If any compound has a % D > 90%, estimate positive results (J) and reject nondetects (R).
If any compound has r < 0.995, estimate positive results and nondetects.

A separate worksheet should be filled for each initial curve

All criteria were met _X_
Criteria were not met
and/or see below _____

V A. BLANK ANALYSIS RESULTS (Sections 1 & 2)

The assessment of the blank analysis results is to determine the existence and magnitude of contamination problems. The criteria for evaluation of blanks apply only to blanks associated with the samples, including trip, equipment, and laboratory blanks. If problems with any blanks exist, all data associated with the case must be carefully evaluated to determine whether or not there is an inherent variability in the data for the case, or if the problem is an isolated occurrence not affecting other data.

List the contamination in the blanks below. High and low levels blanks must be treated separately.

Laboratory blanks

DATE ANALYZED	LAB ID	LEVEL/ MATRIX	COMPOUND	CONCENTRATION UNITS
All_method_blank_meeth_method_specific_criteria				

Field/Equipment/Trip blank

DATE ANALYZED	LAB ID	LEVEL/ MATRIX	COMPOUND	CONCENTRATION UNITS
No_field/trip/equipment_blanks_included_in_this_data_package.				

All criteria were met __X__
Criteria were not met
and/or see below _____

V B. BLANK ANALYSIS RESULTS (Section 3)

Blank Actions

Action Levels (ALs) should be based upon the highest concentration of contaminant determined in any blank. Do not qualify any blank with another blank. The ALs for samples which have been diluted should be corrected for the sample dilution factor and/or % moisture, where applicable. No positive sample results should be reported unless the concentration of the compound in the samples exceeds the ALs:

ALs = 10x the amount of common contaminants (methylene chloride, acetone, 2-butanone, and toluene)
ALs = 5x for any other compounds

Specific actions are as follows:

If the concentration is < sample quantitation limit (SQL) and ≤ AL, report the compound as not detected (U) at the SQL.
If the concentration is ≥ SQL but ≤ AL, report the compound as not detected (U) at the reported concentration.
If the concentration is ≥ SQL and > AL, report the concentration unqualified.

Notes:

High and low level blanks must be treated separately
Compounds qualified "U" for blank contamination are still considered "hits" when qualifying for calibration criteria.

CONTAMINATION SOURCE/LEVEL	COMPOUND	CONC/UNITS	AL/UNITS	SQL	AFFECTED SAMPLES

All criteria were met ___X___
Criteria were not met
and/or see below _____

SURROGATE SPIKE RECOVERIES

Laboratory performance of individual samples is established by evaluation of surrogate spike recoveries. All samples are spiked with surrogate compounds prior to sample analysis. The accuracy of the analysis is measured by the surrogate percent recovery. Since the effects of the sample matrix are frequently outside the control of the laboratory and may present relatively unique problems, the validation of data is frequently subjective and demands analytical experience and professional judgment.
List the percent recoveries (%Rs) which do not meet the criteria for surrogate recovery.
Matrix: solid/aqueous

SAMPLE ID	SURROGATE COMPOUND				ACTION
	Hexanol	~~DBFM~~	~~TOL-d8~~	~~BFB~~	
_All_surrogate_recoveries_within_laboratory_control_limits._____					
_____					
_____					
_____					
_____					

QC Limits* (Aqueous)
_____LL_to_UL___ _73_to_123_ ___to_____ ___to_____ ___to_____
QC Limits* (Solid-Low)
_____LL_to_UL___ _52_to_141__ ___to_____ ___to_____ ___to_____
QC Limits* (Solid-Med)
_____LL_to_UL___ ____to_____ ___to_____ ___to_____ ___to_____

1,2-DCA = 1,2-Dichloromethane-d4 TOL-d8 = Toluene-d8
DBFM = Dibromofluoromethane BFB = Bromofluorobenzene

* QC limits are laboratory in-house performance criteria, LL = lower limit, UL = upper limit.
* If QC limits are not available, use limits of 80 – 120 % for aqueous and 70 – 130 % for solid samples.

Actions:

QUALITY	%R < 10%	%R = 10% - LL	%R > UL
Positive results	J	J	J
Nondetects results	R	UJ	Accept

Surrogate action should be applied:

If one or more surrogate in the VOC fraction is out of specification, but has a recovery of > 10%.
If any one surrogate in a fraction shows < 10 % recovery.

All criteria were met ___X___
Critena were not met
and/or see below _____

VII. A MATRIX SPIKE/MATRIX SPIKE DUPLICATE (MS/MSD)

This data is generated to determine long term precision and accuracy in the analytical method for various matrices. This data alone cannot be used to evaluate the precision and accuracy of individual samples. If any % R in the MS or MSD falls outside the designated range, the reviewer should determine if there are matrix effects, i.e. LCS data are within the QC limits but MS/MSD data are outside QC limit.

1. MS/MSD Recoveries and Precision Criteria

The laboratory should use one MS and a duplicate analysis of an unspiked field sample if target analytes are expected in the sample. If target analytes are not expected, MS/MSD should be analyzed.

List the %Rs, RPD of the compounds which do not meet the criteria.

Sample ID:__JC20386-1MS/-MSD_____ Matrix/Level:_____Aqueous_____
Sample ID:__JC19914-2MS/-MSD_____ Matrix/Level:_____Soil_____

MS OR MSD COMPOUND % R RPD QC LIMITS ACTION

MS/MSD%_recoveries_and_RPD_within_laboratory_control_limits._____

* QC limits are laboratory in-house performance criteria, LL = lower limit, UL = upper limit.
* If QC limits are not available, use limits of 70 – 130 %.

Actions:

QUALITY	%R < LL	%R > UL
Positive results	J	J
Nondetects results	R	Accept

MS/MSD criteria apply only to the unspiked sample, its dilutions, and the associated MS/MSD samples:

If the % R for the affected compounds were < LL (or 70 %), qualify positive results (J) and nondetects (UJ).
If the % R for the affected compounds were > UL (or 130 %), only qualify positive results (J).
If 25 % or more of all MS/MSD %R were < LL (or 70 %) or if two or more MS/MSD %Rs were < 10%, qualify all positive results (J) and reject nondetects (R).

All criteria were met __X__
Criteria were not met
and/or see below _____

VII. B MATRIX SPIKE/MATRIX SPIKE DUPLICATE

MS/MSD – Unspiked Compounds

It should be noted that Region 2 SOP HW-24 does not specify a MS/MSD criteria for the unspiked compounds in the sample. A %RSD of < 50% has therefore been utilized as professional judgment.

If all target analytes were spiked in the MS/MSD, this review element is not applicable.

List the %RSD of the compounds which do not meet the criteria.

Sample ID:_____-_____ Matrix/Level/Unit:_____-_____

COMPOUND	SAMPLE CONC.	MS CONC.	MSD CONC.	% RSD	ACTION

Actions:

* If the % RSD > 50, qualify the positive result in the unspiked samples as estimated (J).
* If the % RSD is not calculated (NC) due to nondetected value, use professional judgment to qualify the data.

A separate worksheet should be used for each MS/MSD pair.

All criteria were met __X__
Criteria were not met
and/or see below _____

VIII. LABORATORY CONTROL SAMPLE (LCS) ANALYSIS

This data is generated to determine accuracy of the analytical method for various matrices.

1. LCS Recoveries Criteria

Where LCS spiked with the same analyte at the same concentrations as the MS/MSD? **Yes** or No. If no make note in data review memo.
List the %R of compounds which do not meet the criteria

LCS ID COMPOUND % R QC LIMIT

___Recoveries_within_laboratory_control_limits._____
_____
_____
_____
_____
_____
_____

Note:

* QC limits are laboratory in-house performance criteria, LL = lower limit, UL = upper limit.
* If QC limits are not available, use limits of 70 – 130 %.

Actions:

QUALITY	%R < LL	%R > UL
Positive results	J	J
Nondetects results	R	Accept

All analytes in the associated sample results are qualified for the following criteria.

If 25 % of the LCS recoveries were < LL (or 70 %), qualify all positive results (j) and reject nondetects (R).
If two or more LCS were below 10 %, qualify all positive results as (J) and reject nondetects (R).

2. Frequency Criteria:

Where LCS analyzed at the required frequency and for each matrix? Yes or No.
If no, the data may be affected. Use professional judgment to determine the severity of the effect and qualify data accordingly. Discuss any actions below and list the samples affected.

All criteria were met ___N/A___
Criteria were not met
and/or see below _____

IX. FIELD/LABORATORY DUPLICATE PRECISION

Sample IDs: _____-_____ Matrix:_____-_____

Field/laboratory duplicates samples may be taken and analyzed as an indication of overall precision. These analyses measure both field and lab precision; therefore, the results may have more variability than laboratory duplicates which only laboratory performance. It is also expected that soil duplicate results will have a greater variance than water matrices due to difficulties associated with collecting identical field duplicate samples.

The project QAPP should be reviewed for project-specific information.
Suggested criteria: RPD ± 30% for aqueous samples, RPD ± 50 % for solid samples. If both samples and duplicate are <5 SQL, the RPD criteria is doubled.

COMPOUND	SQL	SAMPLE CONC.	DUPLICATE CONC.	RPD	ACTION
No field/laboratory duplicate analyzed with this data package. MS/MSD % recoveries RPD used to assess precision. RPD within laboratory and generally acceptable control limits.					

Actions:

Qualify as estimated positive results (J) and nondetects (UJ) for the compound that exceeded the above criteria. For organics, only the sample and duplicate will be qualified.

If an RPD cannot be calculated because one or both of the sample results is not detected, the following actions apply:

If one sample result is not detected and the other is greater than 5x the SQL qualify (J/UJ).

If one sample value is not detected and the other is greater than 5x the SQL and the SQLs for the sample and duplicate are significantly different, use professional judgment to determine if qualification is appropriate.

If one sample value is not detected and the other is less than 5x, use professional judgment to determine if qualification is appropriate.

If both sample and duplicate results are not detected, no action is needed.

All criteria were met __N/A___
Criteria were not met
and/or see below _____

X. INTERNAL STANDARD PERFORMANCE

The assessment of the internal standard (IS) parameter is used to assist the data reviewer in determining the condition of the analytical instrumentation.

List the internal standard area of samples which do not meet the criteria.

* Area of +100% or -50% of the IS area in the associated calibration standard.
* Retention time (RT) within 30 seconds of the IS area in the associated calibration standard.

DATE	SAMPLE ID	IS OUT	IS AREA	ACCEPTABLE RANGE	ACTION

Actions:

1. IS actions should be applied to the compound quantitated with the out-of-control ISs

QUALITY	IS AREA < -25%	IS AREA = -25 % TO – 50%	IS AREA > + 100%
Positive results	J	J	J
Nondetected results	R	UJ	ACCEPT

2. If a IS retention time varies more than 30 seconds, the chromatographic profile for that sample must be examined to determine if any false positive or negative exists. For shifts of a large magnitude, the reviewer may consider partial or total rejection of the data for the sample fraction.

All criteria were met __X__
Criteria were not met
and/or see below _____

XII. SAMPLE QUANTITATION

The sample quantitation evaluation is to verify laboratory quantitation results. In the space below, please show a minimum of one sample calculation:

JC20464-1MS 1-butanol RF = 28.56

[ ] = (140582)/(28.56)

= 4,922 ppm OK

All criteria were met __X__
Criteria were not met
and/or see below _____

XII. QUANTITATION LIMITS

A. Dilution performed

SAMPLE ID	DILUTION FACTOR	REASON FOR DILUTION

B. Percent Solids

List samples which have ≤ 50 % solids

Actions:

If the % solids of a soil sample is 10-50%, estimate positive results (J) and nondetects (UJ)

If the % solids of a soil sample is < 10%, estimate positive results (J) and reject nondetects (R)

EXECUTIVE NARRATIVE

SDG No:	**JC20386**	Laboratory:	**Accutest, New Jersey**
Analysis:	**SW846-8270D**	Number of Samples:	**3**
Location:	BMSMC, Building 5 Area Humacao, PR		

SUMMARY: Three (3) samples were analyzed for the ABN TCL list following method SW846-8270D; Naphthalene and 1,4-Dioxane were also analyzed by SW846-8270D using the selective ion monitoring (SIM) technique. The sample results were assessed according to USEPA data validation guidance documents in the following order of precedence: EPA Hazardous Waste Support Section, SOP HW-35A, July 2015 –Revision 0. *Semivolatile Data Validation*. The QC criteria and data validation actions listed on the data review worksheets are from the primary guidance document, unless otherwise noted.

Results are valid and can be used for decision making purposes.

Critical issues: **None**
Major: **None**
Minor: **None**

Critical findings: **None**
Major findings: **None**
Minor findings:

1. Initial and continuing calibration verifications meet the method and guidance document required performance criteria except the cases describe in the list enclosed. For analytes not meeting the continuing calibration verification criteria, results qualified as estimated (J), (UJ) for non-detects.

No closing calibration verification included in data package. No action taken, professional judgment.

* Analytes with % difference in the continue calibration verification outside the method performance criteria but within the validation guidelines criteria, + 40 %. No action taken.

No qualification was performed on QC samples.

20x dilutions of samples JC20386-1 and JC20386-3 used to report only 1,4-dioxane; analytes not meeting the continuing calibration verification not qualified.

2. MSMSD % recovery outside control limits for several analytes in JC20109-2MS/MSD. No action taken, MS/MSD results apply to the unspiked sample. Unspiked sample was from another project.

COMMENTS: Results are valid and can be used for decision making purposes.

Reviewers Name: Rafael Infante
Chemist License 1888

Signature: 

Date: June 12, 2016

SAMPLE ORGANIC DATA SAMPLE SUMMARY

Sample ID: JC20386-1
Sample location: BMSMC Building 5 Area
Sampling date: 5/15/2016
Matrix: Groundwater

METHOD: 8270D

Analyte Name	Result	Units	Dilution Factor	Lab Flag	Validation	Reportable
2-Chlorophenol	5.7	ug/l	1	-	U	Yes
4-Chloro-3-methyl phenol	5.7	ug/l	1	-	U	Yes
2,4-Dichlorophenol	2.3	ug/l	1	-	U	Yes
2,4-Dimethylphenol	5.7	ug/l	1	-	U	Yes
2,4-Dinitrophenol	11	ug/l	1	-	U	Yes
4,6-Dinitro-o-cresol	5.7	ug/l	1	-	U	Yes
2-Methylphenol	2.3	ug/l	1	-	U	Yes
3&4-Methylphenol	2.3	ug/l	1	-	U	Yes
2-Nitrophenol	5.7	ug/l	1	-	U	Yes
4-Nitrophenol	11	ug/l	1	-	U	Yes
Pentachlorophenol	5.7	ug/l	1	-	U	Yes
Phenol	2.3	ug/l	1	-	U	Yes
2,3,4,6-Tetrachlorophenol	5.0	ug/l	1	-	U	Yes
2,4,5-Trichlorophenol	5.0	ug/l	1	-	U	Yes
2,4,6-Trichlorophenol	5.0	ug/l	1	-	U	Yes
Acenaphthene	1.1	ug/l	1	-	U	Yes
Acenaphthylene	1.1	ug/l	1	-	U	Yes
Acetophenone	2.3	ug/l	1	-	U	Yes
Anthracene	1.1	ug/l	1	-	U	Yes
Atrazine	2.3	ug/l	1	-	U	Yes
Benzaldehyde	5.7	ug/l	1	-	U	Yes
Benzo(a)anthracene	1.1	ug/l	1	-	U	Yes
Benzo(a)pyrene	1.1	ug/l	1	-	U	Yes
Benzo(b)fluoranthene	1.1	ug/l	1	-	U	Yes
Benzo(g,h,i)perylene	1.1	ug/l	1	-	U	Yes
Benzo(k)fluoranthene	1.1	ug/l	1	-	U	Yes
4-Bromophenyl phenyl ether	1.1	ug/l	1	-	U	Yes
Butyl benzyl phthalate	2.3	ug/l	1	-	U	Yes
1,1'-Biphenyl	1.1	ug/l	1	-	U	Yes
2-Chloronaphthalene	2.3	ug/l	1	-	U	Yes
4-Chloroaniline	5.7	ug/l	1	-	UJ	Yes
Carbazole	1.1	ug/l	1	-	U	Yes
Caprolactam	2.3	ug/l	1	-	U	Yes
Chrysene	1.1	ug/l	1	-	U	Yes
bis(2-Chloroethoxy)methane	2.3	ug/l	1	-	U	Yes
bis(2-Chloroethyl)ether	2.3	ug/l	1	-	U	Yes

bis(2-Chloroisopropyl)ether	2.3	ug/l	1	-	U	Yes
4-Chlorophenyl phenyl ether	2.3	ug/l	1	-	U	Yes
2,4-Dinitrotoluene	1.1	ug/l	1	-	U	Yes
2,6-Dinitrotoluene	1.1	ug/l	1	-	U	Yes
3,3'-Dichlorobenzidine	2.3	ug/l	1	-	U	Yes
1,4-Dioxane	553	ug/l	20	-	-	Yes
Dibenzo(a,h)anthracene	1.1	ug/l	1	-	U	Yes
Dibenzofuran	5.7	ug/l	1	-	U	Yes
Di-n-butyl phthalate	2.3	ug/l	1	-	U	Yes
Di-n-octyl phthalate	2.3	ug/l	1	-	U	Yes
Diethyl phthalate	2.3	ug/l	1	-	U	Yes
Dimethyl phthalate	2.3	ug/l	1	-	U	Yes
bis(2-Ethylhexyl)phthalate	2.3	ug/l	1	-	U	Yes
Fluoranthene	1.0	ug/l	1	-	U	Yes
Fluorene	1.1	ug/l	1	-	U	Yes
Hexachlorobenzene	1.1	ug/l	1	-	U	Yes
Hexachlorobutadiene	1.1	ug/l	1	-	U	Yes
Hexachlorocyclopentadiene	11	ug/l	1	-	U	Yes
Hexachloroethane	2.3	ug/l	1	-	U	Yes
Indeno(1,2,3-cd)pyrene	1.1	ug/l	1	-	U	Yes
Isophorone	2.3	ug/l	1	-	U	Yes
1-Methylnaphthalene	1.1	ug/l	1	-	U	Yes
2-Methylnaphthalene	1.1	ug/l	1	-	U	Yes
2-Nitroaniline	5.7	ug/l	1	-	UJ	Yes
3-Nitroaniline	5.7	ug/l	1	-	UJ	Yes
4-Nitroaniline	5.7	ug/l	1	-	U	Yes
Nitrobenzene	2.3	ug/l	1	-	U	Yes
N-Nitroso-di-n-propylamine	2.3	ug/l	1	-	U	Yes
Nitrosodiphenylamine	5.7	ug/l	1	-	U	Yes
Phenanthrene	1.1	ug/l	1	-	U	Yes
Pyrene	1.1	ug/l	1	-	U	Yes
1,2,4,5-Tetrachlorobenzene	2.3	ug/l	1	-	UJ	Yes
	METHOD: 8270D (SIM)					
Naphthalene	0.11	ug/l	1	-	U	Yes

Sample ID: JC20386-2
Sample location: BMSMC Building 5 Area
Sampling date: 5/15/2016
Matrix: Soil

METHOD: 8270D

Analyte Name	Result	Units	Dilution Factor	Lab Flag	Validation	Reportable
2-Chlorophenol	81	ug/kg	1	-	U	Yes
4-Chloro-3-methyl phenol	200	ug/kg	1	-	U	Yes
2,4-Dichlorophenol	200	ug/kg	1	-	U	Yes
2,4-Dimethylphenol	200	ug/kg	1	-	U	Yes
2,4-Dinitrophenol	200	ug/kg	1	-	U	Yes
4,6-Dinitro-o-cresol	200	ug/kg	1	-	U	Yes
2-Methylphenol	81	ug/kg	1	-	U	Yes
3&4-Methylphenol	81	ug/kg	1	-	U	Yes
2-Nitrophenol	200	ug/kg	1	-	U	Yes
4-Nitrophenol	400	ug/kg	1	-	U	Yes
Pentachlorophenol	200	ug/kg	1	-	U	Yes
Phenol	81	ug/kg	1	-	U	Yes
2,3,4,6-Tetrachlorophenol	200	ug/kg	1	-	U	Yes
2,4,5-Trichlorophenol	200	ug/kg	1	-	U	Yes
2,4,6-Trichlorophenol	200	ug/kg	1	-	U	Yes
Acenaphthene	40	ug/kg	1	-	U	Yes
Acenaphthylene	40	ug/kg	1	-	U	Yes
Acetophenone	200	ug/kg	1	-	U	Yes
Anthracene	40	ug/kg	1	-	U	Yes
Atrazine	81	ug/kg	1	-	U	Yes
Benzo(a)anthracene	40	ug/kg	1	-	U	Yes
Benzo(a)pyrene	40	ug/kg	1	-	U	Yes
Benzo(b)fluoranthene	40	ug/kg	1	-	U	Yes
Benzo(g,h,i)perylene	40	ug/kg	1	-	U	Yes
Benzo(k)fluoranthene	40	ug/kg	1	-	U	Yes
4-Bromophenyl phenyl ether	81	ug/kg	1	-	U	Yes
Butyl benzyl phthalate	81	ug/kg	1	-	U	Yes
1,1'-Biphenyl	81	ug/kg	1	-	U	Yes
Benzaldehyde	200	ug/kg	1	-	U	Yes
2-Chloronaphthalene	81	ug/kg	1	-	U	Yes
4-Chloroaniline	200	ug/kg	1	-	U	Yes
Carbazole	81	ug/kg	1	-	U	Yes
Caprolactam	81	ug/kg	1	-	U	Yes
Chrysene	40	ug/kg	1	-	U	Yes
bis(2-Chloroethoxy)methane	81	ug/kg	1	-	U	Yes
bis(2-Chloroethyl)ether	81	ug/kg	1	-	U	Yes
bis(2-Chloroisopropyl)ether	81	ug/kg	1	-	U	Yes
4-Chlorophenyl phenyl ether	81	ug/kg	1	-	U	Yes

2,4-Dinitrotoluene	40	ug/kg	1	-	U	Yes
2,6-Dinitrotoluene	40	ug/kg	1	-	U	Yes
3,3'-Dichlorobenzidine	81	ug/kg	1	-	U	Yes
1,4-Dioxane	441	ug/kg	1	-	-	Yes
Dibenzo(a,h)anthracene	40	ug/kg	1	-	U	Yes
Dibenzofuran	32.3	ug/kg	1	J	UJ	Yes
Di-n-butyl phthalate	81	ug/kg	1	-	U	Yes
Di-n-octyl phthalate	81	ug/kg	1	-	U	Yes
Diethyl phthalate	81	ug/kg	1	-	U	Yes
Dimethyl phthalate	81	ug/kg	1	-	U	Yes
bis(2-Ethylhexyl)phthalate	116	ug/kg	1	-	-	Yes
Fluoranthene	19.2	ug/kg	1	J	UJ	Yes
Fluorene	25.3	ug/kg	1	J	UJ	Yes
Hexachlorobenzene	81	ug/kg	1	-	U	Yes
Hexachlorobutadiene	81	ug/kg	1	-	U	Yes
Hexachlorocyclopentadiene	81	ug/kg	1	-	U	Yes
Hexachloroethane	81	ug/kg	1	-	U	Yes
Indeno(1,2,3-cd)pyrene	81	ug/kg	1	-	U	Yes
Isophorone	81	ug/kg	1	-	U	Yes
1-Methylnaphthalene	1340	ug/kg	1	-	-	Yes
2-Methylnaphthalene	1510	ug/kg	1	-	-	Yes
2-Nitroaniline	81	ug/kg	1	-	U	Yes
3-Nitroaniline	81	ug/kg	1	-	U	Yes
4-Nitroaniline	81	ug/kg	1	-	U	Yes
Naphthalene	353	ug/kg	1	-	-	Yes
Nitrobenzene	81	ug/kg	1	-	U	Yes
N-Nitroso-di-n-propylamine	81	ug/kg	1	-	U	Yes
Nitrosodiphenylamine	81	ug/kg	1	-	U	Yes
Phenanthrene	28.2	ug/kg	1	J	UJ	Yes
Pyrene	19.4	ug/kg	1	J	UJ	Yes
1,2,4,5-Tetrachlorobenzene	81	ug/kg	1	-	U	Yes

METHOD: 8270D (SIM)

ANALYTES REPORTED FROM THE SCAN MODE

Sample ID: JC20386-3
Sample location: BMSMC Building 5 Area
Sampling date: 5/15/2016
Matrix: Groundwater

METHOD: 8270D

Analyte Name	Result	Units	Dilution Factor	Lab Flag	Validation	Reportable
2-Chlorophenol	5.7	ug/l	1	-	U	Yes
4-Chloro-3-methyl phenol	5.7	ug/l	1	-	U	Yes
2,4-Dichlorophenol	2.3	ug/l	1	-	U	Yes
2,4-Dimethylphenol	5.6	ug/l	1	-	U	Yes
2,4-Dinitrophenol	11	ug/l	1	-	U	Yes
4,6-Dinitro-o-cresol	5.6	ug/l	1	-	U	Yes
2-Methylphenol	2.3	ug/l	1	-	U	Yes
3&4-Methylphenol	2.3	ug/l	1	-	U	Yes
2-Nitrophenol	5.7	ug/l	1	-	U	Yes
4-Nitrophenol	11	ug/l	1	-	U	Yes
Pentachlorophenol	5.6	ug/l	1	-	U	Yes
Phenol	2.3	ug/l	1	-	U	Yes
2,3,4,6-Tetrachlorophenol	5.7	ug/l	1	-	U	Yes
2,4,5-Trichlorophenol	5.7	ug/l	1	-	U	Yes
2,4,6-Trichlorophenol	5.7	ug/l	1	-	U	Yes
Acenaphthene	1.1	ug/l	1	-	U	Yes
Acenaphthylene	1.1	ug/l	1	-	U	Yes
Acetophenone	2.3	ug/l	1	-	U	Yes
Anthracene	1.1	ug/l	1	-	U	Yes
Atrazine	2.3	ug/l	1	-	U	Yes
Benzaldehyde	5.7	ug/l	1	-	U	Yes
Benzo(a)anthracene	1.1	ug/l	1	-	U	Yes
Benzo(a)pyrene	1.1	ug/l	1	-	U	Yes
Benzo(b)fluoranthene	1.1	ug/l	1	-	U	Yes
Benzo(g,h,i)perylene	1.1	ug/l	1	-	U	Yes
Benzo(k)fluoranthene	1.1	ug/l	1	-	U	Yes
4-Bromophenyl phenyl ether	1.1	ug/l	1	-	U	Yes
Butyl benzyl phthalate	2.3	ug/l	1	-	U	Yes
1,1'-Biphenyl	1.1	ug/l	1	-	U	Yes
2-Chloronaphthalene	2.3	ug/l	1	-	U	Yes
4-Chloroaniline	5.7	ug/l	1	-	UJ	Yes
Carbazole	1.1	ug/l	1	-	U	Yes
Caprolactam	2.3	ug/l	1	-	U	Yes
Chrysene	1.1	ug/l	1	-	U	Yes
bis(2-Chloroethoxy)methane	2.3	ug/l	1	-	U	Yes
bis(2-Chloroethyl)ether	2.3	ug/l	1	-	U	Yes
bis(2-Chloroisopropyl)ether	2.3	ug/l	1	-	U	Yes

4-Chlorophenyl phenyl ether	2.3	ug/l	1	-	U	Yes
2,4-Dinitrotoluene	1.1	ug/l	1	-	U	Yes
2,6-Dinitrotoluene	1.1	ug/l	1	-	U	Yes
3,3'-Dichlorobenzidine	2.3	ug/l	1	-	U	Yes
1,4-Dioxane	968	ug/l	20	-	-	Yes
Dibenzo(a,h)anthracene	1.1	ug/l	1	-	U	Yes
Dibenzofuran	5.7	ug/l	1	-	U	Yes
Di-n-butyl phthalate	2.3	ug/l	1	-	U	Yes
Di-n-octyl phthalate	2.3	ug/l	1	-	U	Yes
Diethyl phthalate	2.3	ug/l	1	-	U	Yes
Dimethyl phthalate	2.3	ug/l	1	-	U	Yes
bis(2-Ethylhexyl)phthalate	2.3	ug/l	1	-	U	Yes
Fluoranthene	1.1	ug/l	1	-	U	Yes
Fluorene	1.1	ug/l	1	-	U	Yes
Hexachlorobenzene	1.1	ug/l	1	-	U	Yes
Hexachlorobutadiene	1.1	ug/l	1	-	U	Yes
Hexachlorocyclopentadiene	11	ug/l	1	-	U	Yes
Hexachloroethane	2.3	ug/l	1	-	U	Yes
Indeno(1,2,3-cd)pyrene	1.1	ug/l	1	-	U	Yes
Isophorone	2.3	ug/l	1	-	U	Yes
1-Methylnaphthalene	1.1	ug/l	1	-	U	Yes
2-Methylnaphthalene	1.1	ug/l	1	-	U	Yes
2-Nitroaniline	5.7	ug/l	1	-	UJ	Yes
3-Nitroaniline	5.7	ug/l	1	-	UJ	Yes
4-Nitroaniline	5.7	ug/l	1	-	U	Yes
Nitrobenzene	2.3	ug/l	1	-	U	Yes
N-Nitroso-di-n-propylamine	2.3	ug/l	1	-	U	Yes
Nitrosodiphenylamine	5.7	ug/l	1	-	U	Yes
Phenanthrene	1.1	ug/l	1	-	U	Yes
Pyrene	1.1	ug/l	1	-	U	Yes
1,2,4,5-Tetrachlorobenzene	2.3	ug/l	1	-	U	Yes

Project Number:_JC20386_____
Date:_____May_15,_2016_____
Shipping Date:__May_16,_2016_____
EPA Region:_____2_____

REVIEW OF SEMIVOLATILE ORGANIC PACKAGE

The following guidelines for evaluating volatile organics were created to delineate required validation actions. This document will assist the reviewer in using professional judgment to make more informed decision and in better serving the needs of the data users. The sample results were assessed according to USEPA data validation guidance documents in the following order of precedence: EPA Hazardous Waste Support Section, SOP HW-35A, July 2015 –Revision 0. *Semivolatile Data Validation.* The QC criteria and data validation actions listed on the data review worksheets are from the primary guidance document, unless otherwise noted.

The hardcopied (laboratory name) _Accutest_____ data package received has been reviewed and the quality control and performance data summarized. The data review for SVOCs included:

Lab. Project/SDG No.: ____JC20386_____ Sample matrix: _Soil/Groundwater__
No. of Samples: ___3_Full_scan/2_SIM_____

Trip blank No.: _____-_____
Field blank No.: _____-_____
Equipment blank No.:_____-_____
Field duplicate No.:_____-_____

___X___ Data Completeness
___X___ Holding Times
___X___ GC/MS Tuning
___X___ Internal Standard Performance
___X___ Blanks
___X___ Surrogate Recoveries
___X___ Matrix Spike/Matrix Spike Duplicate
___X___ Laboratory Control Spikes
___X___ Field Duplicates
___X___ Calibrations
___X___ Compound Identifications
___X___ Compound Quantitation
___X___ Quantitation Limits

Overall Comments:_ABN_TCL_list_by_method_SW846-8270D;_Naphthalene_and_1,4-Dioxane_
_analyzed_by_method_SW846-8270D_(SIM)_____
_____

Definition of Qualifiers:

J- Estimated results
U- Compound not detected
R- Rejected data
UJ- Estimated nondetect

Reviewer:_____
Date:___June_12,_2016_____

DATA REVIEW WORKSHEETS

DATA COMPLETENESS

MISSING INFORMATION	DATE LAB. CONTACTED	DATE RECEIVED

All criteria were met __X__
Criteria were not met
and/or see below _____

HOLDING TIMES

The objective of this parameter is to ascertain the validity of the results based on the holding time of the sample from time of collection to the time of analysis.

Complete table for all samples and note the analysis and/or preservation not within criteria

SAMPLE ID	DATE SAMPLED	DATE EXTRACTED/ANALYZED	pH	ACTION
All samples extracted and analyzed within method recommended holding time. Sample preservation was acceptable.				

Cooler temperature (Criteria: 4 ± 2 °C): _____4.5°C_____

Actions

Results will be qualified based on the criteria of the following Table:

Table 1. Holding Time Actions for Semivolatile Analyses

Matrix	Preserved	Criteria	Action	
			Detected Associated Compounds	Non-Detected Associated Compounds
Aqueous	No	≤ 7 days (for extraction) ≤ 40 days (for analysis)	Use professional judgment	
	No	> 7 days (for extraction) > 40 days (for analysis)	J	Use professional judgment
	Yes	≤ 7 days (for extraction) ≤ 40 days (for analysis)	No qualification	
	Yes	> 7 days (for extraction) > 40 days (for analysis)	J	UJ
	Yes/No	Grossly Exceeded	J	UJ or R
Non-Aqueous	No	≤ 14 days (for extraction) ≤ 40 days (for analysis)	Use professional judgment	
	No	> 14 days (for extraction) > 40 days (for analysis)	J	Use professional judgment
	Yes	≤ 14 days (for extraction) ≤ 40 days (for analysis)	No qualification	
	Yes	> 14 days (for extraction) > 40 days (for analysis)	J	UJ
	Yes/No	Grossly Exceeded	J	UJ or R

All criteria were met _X__
Criteria were not met see below ____

GC/MS TUNING

The assessment of the tuning results is to determine if the sample instrumentation is within the standard tuning QC limits

_X__ The DFTPP performance results were reviewed and found to be within the specified criteria.

_X__ DFTPP tuning was performed for every 12 hours of sample analysis.

If no, use professional judgment to determine whether the associated data should be accepted, qualified or rejected.

Notes: These requirements do not apply when samples are analyzed by the Selected Ion Monitoring (SIM) technique.

All mass spectrometer conditions must be identical to those used during the sample analysis. Background subtraction actions resulting in spectral distortion are unacceptable

Notes: No data should be qualified based of DFTPP failure.

The requirement to analyze the instrument performance check solution is optional when analysis of PAHs/pentachlorophenol is to be performed by the SIM technique.

List the samples affected:

Actions:

1. If sample are analyzed without a preceding valid instrument performance check or are analyzed 12 hours after the Instrument Performance Check, qualify all data in those samples as unusable (R).
2. If ion abundance criteria are not met, use professional judgment to determine to what extent the data may be utilized.
3. State in the Data Review Narrative, decisions to use analytical data associated with DFTPP instrument performance checks not meeting the contract requirements.
4. Use professional judgment to determine if associated data should be qualified based on the spectrum of the mass calibration compounds.

All criteria were met ___X___
Criteria were not met
and/or see below _____

INITIAL CALIBRATION VERIFICATION

Compliance requirements for satisfactory instrument calibration are established to ensure that the instrument is capable of producing and maintaining acceptable quantitative data.

Date of initial calibration:_____05/18/16_(SIM)_____ ___05/17/2016_(Scan)_____
Instrument ID numbers:_____GCMS4P_____ ___GCMSZ_____
Matrix/Level:_____Aqueous/low_____ ___Aqueous/low_____

Date of initial calibration:_04/04-05/2016_(Scan)_____ ___04/14/16_(SIM)_____
___05/25/16_(SIM)_____
Instrument ID numbers:_____GCMSF_____ ___GCMS4M_____
Matrix/Level:_____Aqueous/low_____ ___Aqueous/low_____

DATE	LAB FILE ID#	CRITERIA OUT RFs, %RSD, %D, r	COMPOUND	SAMPLES AFFECTED
Initial and initial calibration verification meets the method and guidance validation document performance criteria.				

Actions:

Qualify the initial calibration analytes listed in Table 2 using the following criteria:

Table 3. Initial Calibration Actions for Semivolatile Analysis

Criteria	Action	
	Detect	Non-detect
Initial Calibration not performed at specified frequency and sequence	Use professional judgment R	Use professional judgment R
Initial Calibration not performed at the specified concentrations	J	UJ
RRF < Minimum RRF in Table 2 for target analyte	Use professional judgment J+ or R	R
RRF ≥ Minimum RRF in Table 2 for target analyte	No qualification	No qualification
%RSD > Maximum %RSD in Table 2 for target analyte	J	Use professional judgment
%RSD ≤ Maximum %RSD in Table 2 for target analyte	No qualification	No qualification

Initial Calibration

Table 2. RRF, %RSD, and %D Acceptance Criteria in Initial Calibration and CCV for Semivolatile Analysis

Analyte	Minimum RRF	Maximum %RSD	Opening Maximum %D[1]	Opening Maximum %D[1]
1,4-Dioxane	0.010	40.0	±40.0	±50.0
Benzaldehyde	0.100	40.0	±40.0	±50.0
Phenol	0.080	20.0	±20.0	±25.0
Bis(2-chloroethyl)ether	0.100	20.0	±20.0	±25.0
2-Chlorophenol	0.200	20.0	±20.0	±25.0
2-Methylphenol	0.010	20.0	±20.0	±25.0
3-Methylphenol	0.010	20.0	±20.0	±25.0
2,2'-Oxybis-(1-chloropropane)	0.010	20.0	±25.0	±50.0
Acetophenone	0.060	20.0	±20.0	±25.0
4-Methylphenol	0.010	20.0	±20.0	±25.0
N-Nitroso-di-n-propylamine	0.080	20.0	±25.0	±25.0
Hexachloroethane	0.100	20.0	±20.0	±25.0
Nitrobenzene	0.090	20.0	±20.0	±25.0
Isophorone	0.100	20.0	±20.0	±25.0
2-Nitrophenol	0.060	20.0	±20.0	±25.0
2,4-Dimethylphenol	0.050	20.0	±25.0	±50.0
Bis(2-chloroethoxy)methane	0.080	20.0	±20.0	±25.0
2,4-Dichlorophenol	0.060	20.0	±20.0	±25.0
Naphthalene	0.200	20.0	±20.0	±25.0
4-Chloroaniline	0.010	40.0	±40.0	±50.0
Hexachlorobutadiene	0.040	20.0	±20.0	±25.0
Caprolactam	0.010	40.0	±30.0	±50.0
4-Chloro-3-methylphenol	0.040	20.0	±20.0	±25.0
2-Methylnaphthalene	0.100	20.0	±20.0	±25.0
Hexachlorocyclopentadiene	0.010	40.0	±40.0	±50.0
2,4,6-Trichlorophenol	0.090	20.0	±20.0	±25.0
2,4,5-Trichlorophenol	0.100	20.0	±20.0	±25.0
1,1'-Biphenyl	0.200	20.0	±20.0	±25.0

Analyte	Minimum RRF	Maximum %RSD	Opening Maximum %D[1]	Opening Maximum %D[1]
2-Chloronaphthalene	0.300	20.0	± 20.0	± 25.0
2-Nitroaniline	0.060	20.0	± 25.0	± 25.0
Dimethylphthalate	0.300	20.0	± 25.0	± 25.0
2,6-Dinitrotoluene	0.080	20.0	± 20.0	± 25.0
Acenaphthylene	0.400	20.0	± 20.0	± 25.0
3-Nitroaniline	0.010	20.0	± 25.0	± 50.0
Acenaphthene	0.200	20.0	± 20.0	± 25.0
2,4-Dinitrophenol	0.010	40.0	± 50.0	± 50.0
4-Nitrophenol	0.010	40.0	± 40.0	± 50.0
Dibenzofuran	0.300	20.0	± 20.0	± 25.0
2,4-Dinitrotoluene	0.070	20.0	± 20.0	± 25.0
Diethylphthalate	0.300	20.0	± 20.0	± 25.0
1,2,4,5-Tetrachlorobenzene	0.100	20.0	± 20.0	± 25.0
4-Chlorophenyl-phenylether	0.100	20.0	± 20.0	± 25.0
Fluorene	0.200	20.0	± 20.0	± 25.0
4-Nitroaniline	0.010	40.0	± 40.0	± 50.0
4,6-Dinitro-2-methylphenol	0.010	40.0	± 30.0	± 50.0
4-Bromophenyl-phenyl ether	0.070	20.0	± 20.0	± 25.0
N-Nitrosodiphenylamine	0.100	20.0	± 20.0	± 25.0
Hexachlorobenzene	0.050	20.0	± 20.0	± 25.0
Atrazine	0.010	40.0	± 25.0	± 50.0
Pentachlorophenol	0.010	40.0	± 40.0	± 50.0
Phenanthrene	0.200	20.0	± 20.0	± 25.0
Anthracene	0.200	20.0	± 20.0	± 25.0
Carbazole	0.050	20.0	± 20.0	± 25.0
Di-n-butylphthalate	0.500	20.0	± 20.0	± 25.0
Fluoranthene	0.100	20.0	± 20.0	± 25.0
Pyrene	0.400	20.0	± 25.0	± 50.0
Butylbenzylphthalate	0.100	20.0	± 25.0	± 50.0

Analyte	Minimum RRF	Maximum %RSD	Opening Maximum %D[1]	Opening Maximum %D[1]
3,3'-Dichlorobenzidine	0.010	40.0	± 40.0	± 50.0
Benzo(a)anthracene	0.300	20.0	± 20.0	± 25.0
Chrysene	0.200	20.0	± 20.0	± 50.0
Bis(2-ethylhexyl) phthalate	0.200	20.0	± 25.0	± 50.0
Di-n-octylphthalate	0.010	40.0	± 40.0	± 50.0
Benzo(b)fluoranthene	0.010	20.0	± 25.0	± 50.0
Benzo(k)fluoranthene	0.010	20.0	± 25.0	± 50.0
Benzo(a)pyrene	0.010	20.0	± 20.0	± 50.0
Indeno(1,2,3-cd)pyrene	0.010	20.0	± 25.0	± 50.0
Dibenzo(a,h)anthracene	0.010	20.0	± 25.0	± 50.0
Benzo(g,h,i)perylene	0.010	20.0	± 30.0	± 50.0
2,3,4,6-Tetrachlorophenol	0.040	20.0	± 20.0	± 50.0
Naphthalene	0.600	20.0	± 25.0	± 25.0
2-Methylnaphthalene	0.300	20.0	± 20.0	± 25.0
Acenaphthylene	0.900	20.0	± 20.0	± 25.0
Acenaphthene	0.500	20.0	± 20.0	± 25.0
Fluorene	0.700	20.0	± 25.0	± 50.0
Phenanthrene	0.300	20.0	± 25.0	± 50.0
Anthracene	0.400	20.0	± 25.0	± 50.0
Fluoranthene	0.400	20.0	± 25.0	± 50.0
Pyrene	0.500	20.0	± 30.0	± 50.0
Benzo(a)anthracene	0.400	20.0	± 25.0	± 50.0
Chyrsene	0.400	20.0	± 25.0	± 50.0
Benzo(b)fluoranthene	0.100	20.0	± 30.0	± 50.0
Benzo(k)fluoranthene	0.100	20.0	± 30.0	± 50.0
Benzo(a)pyrene	0.100	20.0	± 25.0	± 50.0
Indeno(1,2,3-cd)pyrene	0.100	20.0	± 40.0	± 50.0
Dibenzo(a,h)anthracene	0.010	25.0	± 40.0	± 50.0
Benzo(g,h,i)perylene	0.020	25.0	± 40.0	± 50.0

Pentachlorophenol	0.010	40.0	± 50.0	± 50.0
Deuterated Monitoring Compounds				

Analyte	Minimum RRF	Maximum %RSD	Opening Maximum %D[1]	Closing Maximum %D
1,4-Dioxane-d_8	0.010	20.0	± 25.0	± 50.0
Phenol-d_5	0.010	20.0	± 25.0	± 25.0
Bis-(2-chloroethyl)ether-d_8	0.100	20.0	± 20.0	± 25.0
2-Chlorophenol-d_4	0.200	20.0	± 20.0	± 25.0
4-Methylphenol-d_8	0.010	20.0	± 20.0	± 25.0
4-Chloroaniline-d_4	0.010	40.0	± 40.0	± 50.0
Nitrobenzene-d_5	0.050	20.0	± 20.0	± 25.0
2-Nitrophenol-d_4	0.050	20.0	± 20.0	± 25.0
2,4-Dichlorophenol-d_3	0.060	20.0	± 20.0	± 25.0
Dimethylphthalate-d_6	0.300	20.0	± 20.0	± 25.0
Acenaphthylene-d_8	0.400	20.0	± 20.0	± 25.0
4-Nitrophenol-d_4	0.010	40.0	± 40.0	± 50.0
Fluorene-d_{10}	0.100	20.0	± 20.0	± 25.0
4,6-Dinitro-2-methylphenol-d_2	0.010	40.0	± 30.0	± 50.0
Anthracene-d_{10}	0.300	20.0	± 20.0	± 25.0
Pyrene-d_{10}	0.300	20.0	± 25.0	± 50.0
Benzo(a)pyrene-d_{12}	0.010	20.0	± 20.0	± 50.0
Fluoranthene-d_{10} (SIM)	0.400	20.0	± 25.0	± 50.0
2-Methylnaphthalene-d_{10} (SIM)	0.300	20.0	± 20.0	± 25.0

[1] If a closing CCV is acting as an opening CCV, all target analytes must meet the requirements for an opening CCV.

Note: If analysis by SIM technique is requested for PAH/pentachlorophenols, calibration standards analyzed at 0.10, 0.20, 0.40, 0.80, and 1.0 ng/uL for each target compound of interest and the associated DMCs. Pentachlorophenol will require only a four point initial calibration at 0.20, 0.40, 0.80, and 1.0 ng/uL.

All criteria were met _____
Criteria were not met
and/or see below ___X___

CONTINUING CALIBRATION VERIFICATION

Compliance requirements for satisfactory instrument calibration are established to ensure that the instrument is capable of producing and maintaining acceptable quantitative data.

Date of initial calibration:_____04/14/16;_05/25/16_(SIM)_____
Date of initial calibration verification (ICV):__04/14/16;__05/26/16_____
Date of continuing calibration verification (CCV):_05/18/16;_05/26/16_____
Date of closing CCV:_____-_____
Instrument ID numbers:_____GCMS4M_____
Matrix/Level:_____Aqueous/low_____

Date of initial calibration:____05/17/16_(Scan)_____
Date of initial calibration verification (ICV):____05/18/16_____
Date of continuing calibration verification (CCV):__05/19/16;_05/20/16_____
Date of closing CCV:_____-_____
Instrument ID numbers:_____GCMSZ_____
Matrix/Level:_____Aqueous/low_____

Date of initial calibration:_____04/04-05/16_(Scan)_____
Date of initial calibration verification (ICV):____04/04-06/16_____
Date of continuing calibration verification (CCV):__05/17/16;_05/18/16_____
Date of closing CCV:_____-_____
Instrument ID numbers:_____GCMSF_____
Matrix/Level:_____Aqueous/low_____

Date of initial calibration:_____05/18/16_(SIM)_____
Date of initial calibration verification (ICV):____05/18/16_____
Date of continuing calibration verification (CCV):__05/19/16;_05/20/16_____
Date of closing CCV:_____-_____
Instrument ID numbers:_____GCMS4P_____
Matrix/Level:_____Aqueous/low_____

DATE	LAB FILE ID#	CRITERIA OUT RFs, %RSD, %D, r	COMPOUND	SAMPLES AFFECTED
GCMS4P				
05/19/16	cc863-1	38.4	1,4-dioxane*	JC20386-2
05/20/16	cc863-0.5	-24.9	Naphthalene	QC sample
GCMSF				
05/17/50	cc6563-50	54.3	4-chloroaniline	JC20386-1; -3
		-22.6	2-nitroaniline	
		26.6	3-nitroaniline	
		-25.0	4-nitrophenol*	
		22.4	4-nitroaniline*	
05/17/16	cc6564-50	21.7	1,2,4,5-tetrachlorobenzene	JC20386-1; -3

DATE	LAB FILE ID#	CRITERIA OUT RFs, %RSD, %D, r	COMPOUND	SAMPLES AFFECTED
GCMSF				
05/18/16	cc6563-50	-25.2	Acetophenone	JC20386-1; -3 (20 x dilution)
		-29.9	N-nitroso-di-n-propylamine	
		33.3	4-chloroaniline*	
		-20.3	Hexachlorocyclopentadiene*	
		-26.8	2-nitroaniline	
		-22.0	4-nitrophenol*	
05/18/16	cc6564-50	23.9	Benzaldehyde*	JC20386-1; -3 (20 x dilution)
GCMSZ				
05/19/16	cc5533-25	-28.6	2,4-dinitrophenol*	QC sample
		-20.3	4,6-dinitro-2-methylphenol*	
05/20/16	cc5533-50	-28.6	2,4-dinitrophenol*	JC20386-2
		-20.2	4,6-dinitro-2-methylphenol*	

Note: Initial and continuing calibration verifications meet the method and guidance document required performance criteria except the cases describe in the list enclosed. For analytes not meeting the continuing calibration verification criteria, results qualified as estimated (J), (UJ) for non-detects.

No closing calibration verification included in data package. No action taken, professional judgment.

* Analytes with % difference in the continue calibration verification outside the method performance criteria but within the validation guidelines criteria, +40 %. No action taken.

No qualification was performed on QC samples.

20 x dilutions of samples used to report only 1,4-dioxane; analyte not meeting the continuing calibration verification not qualified.

Actions:

Notes: Verify that the CCV is run at the required frequency (an opening and closing CCV must be run within 12-hour period).

All DMCs must meet the RRF values given in Table 2. No qualification of the data is necessary on DMCs RRF and %RSD/%D alone. Use professional judgment to evaluate DMCs and %RSD/%D data in conjunction with DMCs recoveries to determine the need for qualification of the data.

Qualify the initial calibration analytes listed in Table 2 using the following criteria in the CCVs:

Table 4. CCV Actions for Semivolatile Analysis

Criteria for Opening CCV	Criteria for Closing CCV	Action	
		Detect	Non-detect
CCV not performed at required frequency and sequence	CCV not performed at required frequency	Use professional judgment R	Use professional judgment R
CCV not performed at specified concentration	CCV not performed at specified concentration	Use professional judgment	Use professional judgment
RRF < Minimum RRF in Table 2 for target analyte	RRF < Minimum RRF in Table 2 for target analyte	Use professional judgment J or R	R
RRF ≥ Minimum RRF in Table 2 for target analyte	RRF ≥ Minimum RRF in Table 2 for target analyte	No qualification	No qualification
%D outside the Opening Maximum %D limits in Table 2 for target analyte	%D outside the Closing Maximum %D limits in Table 2 for target analyte	J	UJ
%D within the inclusive Opening Maximum %D limits in Table 2 for target analyte	%D within the inclusive Closing Maximum %D limits in Table 2 for target analyte	No qualification	No qualification

All criteria were met __X__
Criteria were not met
and/or see below _____

BLANK ANALYSIS RESULTS (Sections 1 & 2)

The assessment of the blank analysis results is to determine the existence and magnitude of contamination problems. The criteria for evaluation of blanks apply only to blanks associated with the samples, including trip, equipment, and laboratory blanks. If problems with any blanks exist, all data associated with the case must be carefully evaluated to determine whether or not there is an inherent variability in the data for the case, or if the problem is an isolated occurrence not affecting other data.

List the contamination in the blanks below. High and low levels blanks must be treated separately.

Notes: The concentration of non-target compounds in all blanks must be less than or equal to 10 ug/L.

The concentration of target compounds in all blanks must be less than its CRQL listed in the method.

Samples taken from a drinking water tap do not have and associated field blank.

Laboratory blanks

DATE ANALYZED	LAB ID	LEVEL/ MATRIX	COMPOUND	CONCENTRATION UNITS
_No_target_analytes_detected_in_method_blanks.				

Field/Equipment/Trip blank

DATE ANALYZED	LAB ID	LEVEL/ MATRIX	COMPOUND	CONCENTRATION UNITS
_No_field/trip/equipment_blanks_analyzed_with_this_data_package.				

All criteria were met __X__
Criteria were not met
and/or see below _____

BLANK ANALYSIS RESULTS (Section 3)

Blank Actions

Qualify samples based on the criteria summarized in Table 5:

Table 5. Blank and TCLP/SPLP LEB Actions for Semivolatile Analysis

Blank Type	Blank Result	Sample Result	Action
Method, TCLP/SPLP LEB, Field	Detect	Non-detect	No qualification
	< CRQL	< CRQL	Report at CRQL and qualify as non-detect (U)
		≥ CRQL	Use professional judgment
	≥ CRQL	< CRQL	Report at CRQL and qualify as non-detect (U)
		≥ CRQL but < Blank Result	Report at sample results and qualify as non-detect (U) or as unusable (R)
		≥ CRQL and ≥ Blank Result	Use professional judgment
	Grossly high	Detect	Report at sample results and qualify as unusable (R)
	TIC > 5.0 ug/L (water) or 0.0050 mg/L (TCLP leachate) or TIC > 170 ug/Kg (soil)	Detect	Use professional judgment

List samples qualified

CONTAMINATION SOURCE/LEVEL	COMPOUND	CONC/UNITS	AL/UNITS	SQL	AFFECTED SAMPLES

All criteria were met __X__
Criteria were not met
and/or see below ____

SURROGATE SPIKE RECOVERIES – DEUTERATED MONITORING COMPOUNDS (DMCs)

Laboratory performance of individual samples is established by evaluation of surrogate spike recoveries – deuterated monitoring compounds. All samples are spiked with surrogate compounds prior to sample analysis. The accuracy of the analysis is measured by the surrogate percent recovery. Since the effects of the sample matrix are frequently outside the control of the laboratory and may present relatively unique problems, the validation of data is frequently subjective and demands analytical experience and professional judgment.

Notes: Recoveries for DMCs in samples and blanks must be within the limits specified in Table 6.

The recovery limits for any of the compounds listed in Table 6 may be expanded at any time during the period of performance if USEPA determines that the limits are too restrictive.

If a DMC is not added in the samples and blanks or the concentrations of DMCs in the samples and blank not the specified, use professional judgment in qualifying the data.

Table 7. DMC Actions for Semivolatile Analysis

Criteria	Action	
	Detect	Non-detect
%R < 10% (excluding DMCs with 10% as a lower acceptance limit)	J-	R
10% ≤ %R (excluding DMCs with 10% as a lower acceptance limit) < Lower Acceptance Limit	J-	UJ
Lower Acceptance limit ≤ %R ≤ Upper Acceptance Limit	No qualification	No qualification
%R > Upper Acceptance Limit	J+	No qualification

List the percent recoveries (%Rs) which do not meet the criteria for DMCs (surrogate) recovery.

Matrix:___Groundwater_____

SAMPLE ID	SURROGATE COMPOUND	ACTION

_DMCs_meet_the_required_criteria._Non-deuterated_surrogates_added_to_the_samples_were__
_within_laboratory_recovery_limits._____

Table 8. Semivolatile DMCs and the Associated Target Analytes

1,4-Dioxane-d_8 (DMC-1)	**Phenol-d_5 (DMC-2)**	**Bis(2-Chloroethyl) ether-d_8 (DMC-3)**
1,4-Dioxane	Benzaldehyde Phenol	Bis(2-chloroethyl)ether 2,2'-Oxybis(1-chloropropane) Bis(2-chloroethoxy)methane
2-Chlorophenol-d_4 (DMC-4)	**4-Methylphenol-d_8 (DMC-5)**	**4-Chloroaniline-d_4 (DMC-6)**
2-Chlorophenol	2-Methylphenol 3-Methylphenol 4-Methylphenol 2,4-Dimethylphenol	4-Chloroaniline Hexachlorocyclopentadiene Dichlorobenzidine
Nitrobenzene-d_5 (DMC-7)	**2-Nitrophenol-d_4 (DMC-8)**	**2,4-Dichlorophenol-d_3 (DMC-9)**
Acetophenone N-Nitroso-di-n-propylamine Hexachloroethane Nitrobenzene 2,6-Dinitrotoluene 2,4-Dinitrotoluene N-Nitrosodiphenylamine	Isophorone 2-Nitrophenol	2,4-Dichlorophenol Hexachlorobutadiene Hexachlorocyclopentadiene 4-Chloro-3-methylphenol 2,4,6-Trichlorophenol 2,4,5-Trichlorophenol 1,2,4,5-Tetrachlorobenzene *Pentachlorophenol 2,3,4,6-Tetrachlorophenol
Dimethylphthalate-d_6 (DMC-10)	**Acenaphthylene-d_8 (DMC-11)**	**4-Nitrophenol-d_4 (DMC-12)**
Caprolactam 1,1'-Biphenyl Dimethylphthalate Diethylphthalate Di-n-butylphthalate Butylbenzylphthalate Bis(2-ethylhexyl) phthalate Di-n-octylphthalate	*Naphthalene *2-Methylnaphthalene 2-Chloronaphthalene *Acenaphthylene *Acenaphthene	2-Nitroaniline 3-Nitroaniline 2,4-Dinitrophenol 4-Nitrophenol 4-Nitroaniline

Fluorene-d_{10} (DMC-13)	**4,6-Dinitro-2-methylphenol-d_2 (DMC-14)**	**Anthracene-d_{10} (DMC-15)**
Dibenzofuran *Fluorene 4-Chlorophenyl-phenylether 4-Bromophenyl-phenylether Carbazole	4,6-Dinitro-2-methylphenol	Hexachlorobenzene Atrazine *Phenanthrene *Anthracene
Pyrene-d_{10} (DMC-16)	**Benzo(a)pyrene-d_{12} (DMC-17)**	
*Fluoranthene *Pyrene *Benzo(a)anthracene *Chrysene	3,3'-Dichlorobenzidine *Benzo(b)fluoranthene *Benzo(k)fluoranthene *Benzo(a)pyrene *Indeno(1,2,3-cd)pyrene *Dibenzo(a,h)anthracene *Benzo(g,h,i)perylene	

*Included in optional Target Analyte List (TAL) of PAHs and PCP only.

Table 9. Semivolatile SIM DMCs and the Associated Target Analytes

Fluoranthene-d10 (DMC-1)	**2-Methylnaphthalene-d10 (DMC-2)**
Fluoranthene	Naphthalene
Pyrene	2-Methylnaphthalene
Benzo(a)anthracene	Acenaphthylene
Chrysene	Acenaphthene
Benzo(b)fluoranthene	Fluorene
Benzo(k)fluoranthene	Pentachlorophenol
Benzo(a)pyrene	Phenanthrene
Indeno(1,2,3-cd)pyrene	Anthracene
Dibenzo(a,h)anthracene	
Benzo(g,h,i)perylene	

All criteria were met __X_____
Criteria were not met
and/or see below _____

VII. A MATRIX SPIKE/MATRIX SPIKE DUPLICATE (MS/MSD)

This data is generated to determine long term precision and accuracy in the analytical method for various matrices. This data alone cannot be used to evaluate the precision and accuracy of individual samples. If any % R in the MS or MSD falls outside the designated range, the reviewer should determine if there are matrix effects, i.e. LCS data are within the QC limits but MS/MSD data are outside QC limit.

1. MS/MSD Recoveries and Precision Criteria

The laboratory should use one MS and a duplicate analysis of an unspiked field sample if target analytes are expected in the sample. If target analytes are not expected, MS/MSD should be analyzed.

NOTES: Data for MS and MSDs will not be present unless requested by the Region. Notify the Contract Laboratory COR if a field or trip blank was used for the MS and MSD.

For a Matrix Spike that does not meet criteria, apply the action to only the field sample used to prepare the Matrix Spike sample. If it is clearly stated in the data validation materials that the samples were taken through incremental sampling or some other method guaranteeing the homogeneity of the sample group, then the entire sample group may be qualified.

List the %Rs, RPD of the compounds which do not meet the criteria.

Sample ID:__JC20109-1_____ Matrix/Level:__Aqueous_____
Sample ID:__JC20109-2___(SIM)_____ Matrix/Level:__Aqueous_____
Sample ID:__JC20218-17A_____ Matrix/Level:__Soil_____
Sample ID:__JC20314-1_(SIM)_____ Matrix/Level:__Soil_____

The QC reported here applies to the following samples: Method: SW846 8270D
JC20386-1

	JC20109-2		Spike	MS	MS	Spike	MSD	MSD		Limits
Compound	ug/l	Q	ug/l	ug/l	%	ug/l	ug/l	%	RPD	Rec/RPD
Naphthalene	ND		2	1.94	97	1	0.760	76	87* a	23-140/36

(a) Outside control limits due to matrix interference.
* Outside control limit.

Note: No action taken, MS/MSD results apply to unspiked sample. Unspiked sample was from another project.

* QC limits are laboratory in-house performance criteria, LL = lower limit, UL = upper limit.
* If QC limits are not available, use limits of 70 – 130 %.

Actions:

QUALITY	%R < LL	%R > UL
Positive results	J	J
Nondetects results	R	Accept

MS/MSD criteria apply only to the unspiked sample, its dilutions, and the associated MS/MSD samples:

If the % R for the affected compounds were < LL (or 70 %), qualify positive results (J) and nondetects (UJ).

If the % R for the affected compounds were > UL (or 130 %), only qualify positive results (J).

If 25 % or more of all MS/MSD %R were < LL (or 70 %) or if two or more MS/MSD %Rs were < 10%, qualify all positive results (J) and reject nondetects (R).

A separate worksheet should be used for each MS/MSD pair.

All criteria were met _X_
Criteria were not met
and/or see below ____

INTERNAL STANDARD PERFORMANCE

The assessment of the internal standard (IS) parameter is used to assist the data reviewer in determining the condition of the analytical instrumentation.

List the internal standard area of samples which do not meet the criteria.

DATE	SAMPLE ID	IS OUT	IS AREA	ACCEPTABLE RANGE	ACTION

Internal area meets the required criteria of batch samples corresponding to this data package.

Action:

1. If an internal standard area count for a sample or blank is greater than 200.0% of the area for the associated standard (opening CCV or mid-point standard from initial calibration) (see Table 10 below):
   a. Qualify detects for compounds quantitated using that internal standard as estimated low (J-).
   b. Do not qualify non-detected associated compounds.
2. If an internal standard area count for a sample or blank is less than 20.0% of the area for the associated standard (opening CCV or mid-point standard from initial calibration):
   a. Qualify detects for compounds quantitated using that internal standard as estimated high (J+).
   b. Qualify non-detected associated compounds as unusable (R).
3. If an internal standard area count for a sample or blank is greater than or equal to 50.0%, and less than or equal to 200% of the area for the associated standard opening CCV or mid-point standard from initial calibration, no qualification of the data is necessary.
4. If an internal standard RT varies by more than 10.0 seconds: Examine the chromatographic profile for that sample to determine if any false positives or negatives exist. For shifts of a large magnitude, the reviewer may consider partial or total rejection of the data for that sample fraction. Detects should not need to be qualified as unusable (R) if the mass spectral criteria are met.
5. If an internal standard RT varies by less than or equal to 10.0 seconds, no qualification of the data is necessary.

Note: Inform the Contract Laboratory Program Project Officer (CLP PO) if the internal standard performance criteria are grossly exceeded. Note in the Data Review Narrative potential effects on the data resulting from unacceptable internal standard performance.

State in the Data Review Narrative if the required internal standard compounds are not added to a sample or blank or if the required internal standard compound is not analyzed at the specified concentration.

Actions:

Table 10. Internal Standard Actions for Semivolatile Analysis

Criteria	Action	
	Detect	Non-detect
Area response < 20% of the opening CCV or mid-point standard CS3 from ICAL	J+	R
20% ≤ Area response < 50% of the opening CCV or mid-point standard CS3 from ICAL	J+	UJ
50% ≤ Area response ≤ 200% of the opening CCV or mid-point standard CS3 from ICAL	No qualification	No qualification
Area response > 200% of the opening CCV or mid-point standard CS3 from ICAL	J-	No qualification
RT shift between sample/blank and opening CCV or mid-point standard CS3 from ICAL > 10.0 seconds	R	R
RT shift between sample/blank and opening CCV or mid-point standard CS3 from ICAL < 10.0 seconds	No qualification	No qualification

All criteria were met __X__
Criteria were not met
and/or see below _____

TARGET COMPOUND IDENTIFICATION

Criteria:

Is the Relative Retention Times (RRTs) of reported compounds within ±0.06 RRT units of the standard RRT [opening Continuing Calibration Verification (CCV) or mid-point standard from the initial calibration]. **Yes?** or No?

List compounds not meeting the criteria described above:

Sample ID	Compounds	Actions
_____	_____	_____
_____	_____	_____
_____	_____	_____

Mass spectra of the sample compound and a current laboratory-generated standard [i.e., the mass spectrum from the associated calibration standard (opening CCV or mid-point standard from initial calibration)] must match according to the following criteria:

a. All ions present in the standard mass spectrum at a relative intensity greater than 10% must be present in the sample spectrum.
b. The relative intensities of these ions must agree within ±20% between the standard and sample spectra (e.g., for an ion with an abundance of 50% in the standard spectrum, the corresponding sample ion abundance must be between 30-70%).
c. Ions present at greater than 10% in the sample mass spectrum, but not present in the standard spectrum, must be evaluated by a reviewer experienced in mass spectral interpretation.

List compounds not meeting the criteria described above:

Sample ID	Compounds	Actions
_____	_____	_____
_Identified_compounds_meet_the_required_criteria____		_____
_____	_____	_____

Action:

1. The application of qualitative criteria for GC/MS analysis of target compounds requires professional judgment. It is up to the reviewer's discretion to obtain additional information from the laboratory. If it is determined that incorrect identifications were made, qualify all such data as unusable (R).

2. Use professional judgment to qualify the data if it is determined that cross-contamination has occurred.

3. Note in the Data Review Narrative any changes made to the reported compounds or concerns regarding target compound identifications. Note, for Contract Laboratory COR action, the necessity for numerous or significant changes.

TENTATIVELY IDENTIFIED COMPOUNDS (TICS)

NOTE: Tentatively identified compounds should only be evaluated when requested by a party from outside of the Hazardous Waste Support Section (HWSS).

List TICs

Sample ID	Compound	Sample ID	Compound

Action:

1. Qualify all TIC results for which there is presumptive evidence of a match (e.g. greater than or equal to 85% match) as tentatively identified (NJ), with approximated concentrations. TICs labeled "unknown" are qualified as estimated (J).
2. General actions related to the review of TIC results are as follows:
   a. If it is determined that a tentative identification of a non-target compound is unacceptable, change the tentative identification to "unknown" or another appropriate identification, and qualify the result as estimated (J).
   b. If all contractually-required peaks were not library searched and quantitated, the Region's designated representative may request these data from the laboratory.
3. In deciding whether a library search result for a TIC represents a reasonable identification, use professional judgment. If there is more than one possible match, report the result as "either compound X or compound Y". If there is a lack of isomer specificity, change the TIC result to a nonspecific isomer result (e.g., 1,3,5-trimethyl benzene to trimethyl benzene isomer) or to a compound class (e.g., 2-methyl, 3-ethyl benzene to a substituted aromatic compound).
4. The reviewer may elect to report all similar compounds as a total (e.g., all alkanes may be summarized and reported as total hydrocarbons).
5. Target compounds from other fractions and suspected laboratory contaminants should be marked as "non-reportable".

6. Other Case factors may influence TIC judgments. If a sample TIC match is poor, but other samples have a TIC with a valid library match, similar RRT, and the same ions, infer identification information from the other sample TIC results.
7. Note in the Data Review Narrative any changes made to the reported data or any concerns regarding TIC identifications.
8. Note, for Contract Laboratory COR action, failure to properly evaluate and report TICs

All criteria were met _X_
Criteria were not met
and/or see below _____

SAMPLE QUANTITATION AND REPORTED CONTRACT REQUIRED QUANTITATION LIMITS (CRQLS)

Action:

1. When a sample is analyzed at more than one dilution, the lower CRQL are used unless a QC exceedance dictates the use of higher CRQLs from the diluted sample. Samples reported with an "E" qualifier should be reported from the diluted sample.
2. If any discrepancies are found, the Region's designated representative may contact the laboratory to obtain additional information that could resolve any differences. If a discrepancy remains unresolved, the reviewer must use professional judgment to decide which value is the most accurate. Under these circumstances, the reviewer may determine that qualification of data is warranted. Note in the Data Review Narrative a description of the reasons for data qualification and the qualification that is applied to the data.
3. For non-aqueous samples, if the solids is less than 10.0%, use professional judgment for both detects and non-detects. If the percent solid for a soil sample is greater than or equal to 10.0% and less than 30.0%, use professional judgment to qualify detects and non-detects. If the percent solid for a soil sample is greater than or equal to 30.0%, detects and non-detects should not be qualified (see Table 11).
4. Note, for Contract Laboratory COR action, numerous or significant failures to accurately quantify the target compounds or to properly evaluate and adjust CRQLs.
5. Results between MDL and CRQL should be qualified as estimated "J".
6. Results < MDL should be reported at the CRQL and qualified "U". MDLs themselves should not be reported.

Table 11. Percent Solids Actions for Semivolatile Analysis for Non-Aqueous Samples

Criteria	Action	
	Detects	Non-detects
%Solids < 10.0%	Use professional judgment	Use professional judgment
10.0% ≤ %Solids ≤ 30.0%	Use professional judgment	Use professional judgment
%Solids > 30.0%	No qualification	No qualification

SAMPLE QUANTITATION

The sample quantitation evaluation is to verify laboratory quantitation results. In the space below, please show a minimum of one sample calculation:

Sample ID:__ JC20386-1___ Analyte:__1,4-dioxane_____ RF:_0.619_

[ ] = (2688680)(40)/(440724)(0.619)
= 394.2 ppm Ok

QUANTITATION LIMITS

A. Dilution performed

SAMPLE ID	DILUTION FACTOR	REASON FOR DILUTION
JC20386-1	20X	1,4-Dioxane over the calibration range
JC20386-3	20X	1,4-Dioxane over the calibration range

All criteria were met __N/A___
Criteria were not met
and/or see below _____

FIELD DUPLICATE PRECISION

Sample IDs: ___JC20386-1/JC20386-2_____ Matrix:____Groundwater_____

Field duplicates samples may be taken and analyzed as an indication of overall precision. These analyses measure both field and lab precision; therefore, the results may have more variability than laboratory duplicates which only laboratory performance. It is also expected that soil duplicate results will have a greater variance than water matrices due to difficulties associated with collecting identical field duplicate samples.

The project QAPP should be reviewed for project-specific information.
Suggested criteria: if large RPD (> 50 %) is observed, confirm identification of the samples and note differences. If both samples and duplicate are <5 SQL, the RPD criteria is doubled.

COMPOUND	SQL ug/L	SAMPLE CONC.	DUPLICATE CONC.	RPD	ACTION
Field duplicate analyzed as part of this data package. RPD within the required criteria < 50 % for detected target analytes.					

All criteria were met __X__
Criteria were not met
and/or see below _____

OTHER ISSUES

A. System Performance

List samples qualified based on the degradation of system performance during simple analysis:

Sample ID	Comments	Actions	

Action:

Use professional judgment to qualify the data if it is determined that system performance has degraded during sample analyses. Inform the Contract Laboratory Program COR any action as a result of degradation of system performance which significantly affected the data.

B. Overall Assessment of Data

List samples qualified based on other issues:

Sample ID	Comments	Actions
_No_other_issues_that_required_the_need_to_qualify_the_data._Results_are_valid_and_can_be_used_for_decission_purposes._____		

Action:

1. Use professional judgment to determine if there is any need to qualify data which were not qualified based on the Quality Control (QC) criteria previously discussed.
2. Write a brief narrative to give the user an indication of the analytical limitations of the data. Inform the Contract Laboratory COR the action, any inconsistency of the data with the Sample Delivery Group (SDG) Narrative. If sufficient information on the intended use and required quality of the data is available, the reviewer should include their assessment of the usability of the data within the given context. This may be used as part of a formal Data Quality Assessment (DQA).
3. Sometimes, due to dilutions, re-analysis or SIM/Scan runs are being performed, there will be multiple results for a single analyte from a single sample. The following criteria and professional judgment are used to determine which result should be reported:
    - The analysis with the lower CRQL
    - The analysis with the better QC results
    - The analysis with the higher results